NATURE MAGAZINE

FEBRUARY SEE PAGE 114 1925

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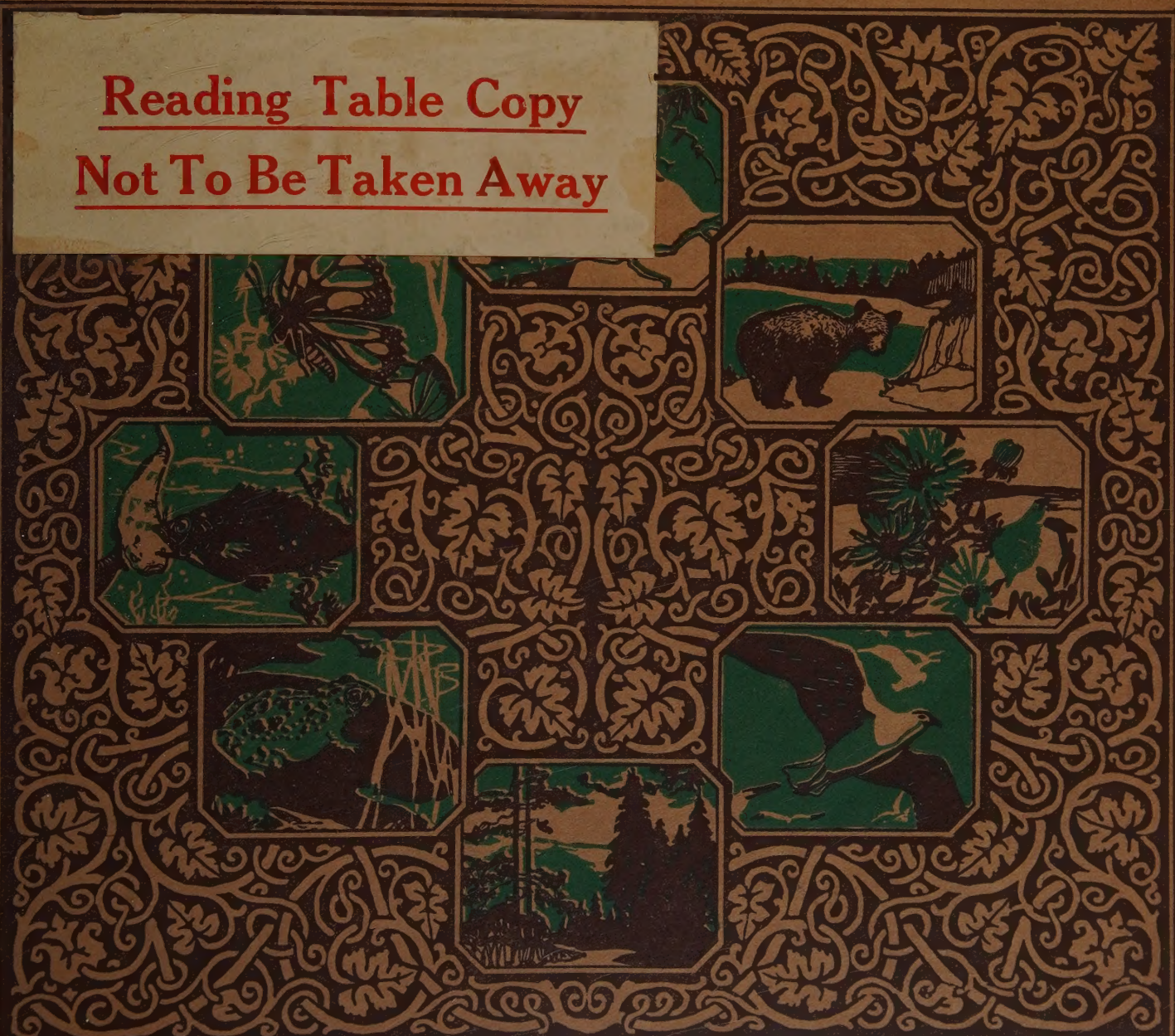

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Nature Calendar

FEBRUARY

> "Many, many welcomes
> February fair-maid,
> Ever as of old time,
> Solitary firstling,
> Coming in the cold time,
> Prophet of the gay time,
> Prophet of the May time,
> Prophet of the roses,
> Many, many welcomes
> February fair-maid."
>
> —*Tennyson.*

Maple buds, large, downy and tinged with dark reddish-brown, are glad promises of spring.

Toward the close of the month we may find the green sword-like leaves of our tulips pushing through the hard unyielding ground in sunny garden spots.

As gay as in autumn are the colors in the woods during the February thaw—rich browns, gay purples, deep reds and both brilliant and dull shades of green, all bordered with the white of the receding snow.

Willow twigs, placed in some warm sunny spot within doors, will soon burst into soft furry "pussies."

This is courting time and nesting time for Great Horned Owls.

The hungry hawk is on the alert for field mice during these days of short rations.

The low drumming of the partridge echoes through the snowy woodlands.

The meadowlark industriously scratches for his dinner among the dried brown weeds of the fields.

The first birds to return to northern haunts will be those whose diet consists mainly of seeds.

We may have the severest cold of the year and the heaviest frosts during this month but toward its close, on milder days, the beautiful flute-like songs of home-coming bluebirds will fill the air with spring music.

Grackles, robins and red-winged blackbirds move northward at the first signal of warmer days to come.

Oft-repeated though the experience may be, each year our hearts quicken at sight of the first robin or at the sound of his cheery voice.

Still icebound in their dens, little black bear cubs, born a month ago, are just opening their eyes.

The chipmunk still sleeps on.

The winter home of the muskrat is often so eaten away from the inside by its hungry occupants during the winter that the roof caves in with the first thaw.

The woodchuck does not always wait for the warmth of spring to call him forth from his long winter's nap. He may come out early and live for weeks upon the fat stored on his own body.

The mink is a terror among the little creatures of the wild. He tracks rabbits with great skill and cunning and even follows the muskrat into his own domicile.

The raccoon, sleeping curled up in a furry ball in the forked branches of a tree, is readily mistaken for a squirrel's nest.

The snow, heavily packed, crunches under foot. On zero days—and there usually are some this month—it lies fine and crumbly like sugar, glistening in the sunshine.

In the mornings the shadows of the evergreen trees lie blue upon the snow.

Do you know:

That the amount of water in the ocean is thirteen times the volume of all the land above sea level?

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Prepared for NATURE MAGAZINE by the Cleveland Museum of Natural History

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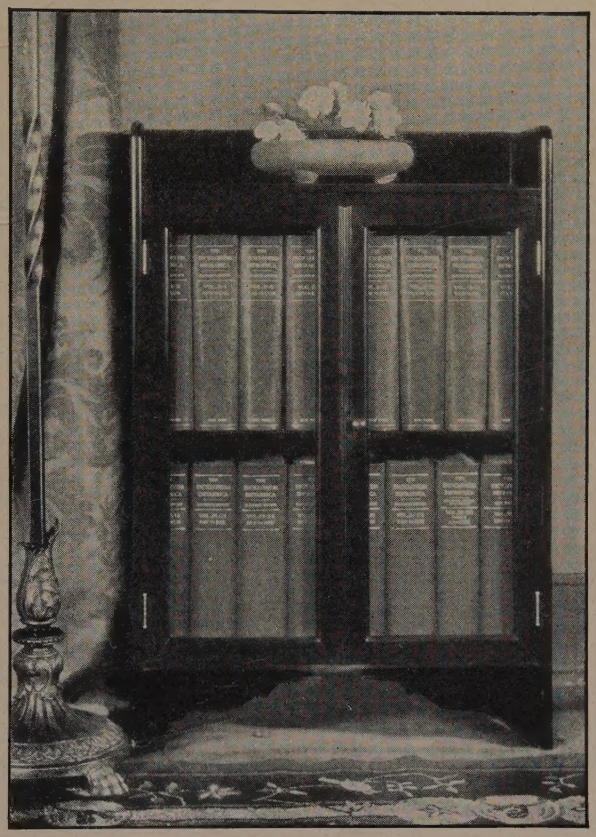

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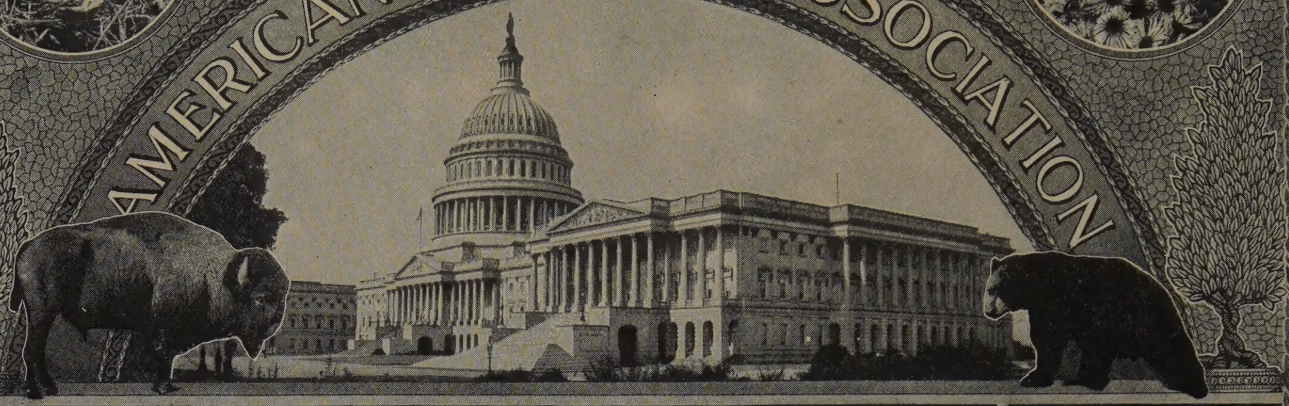

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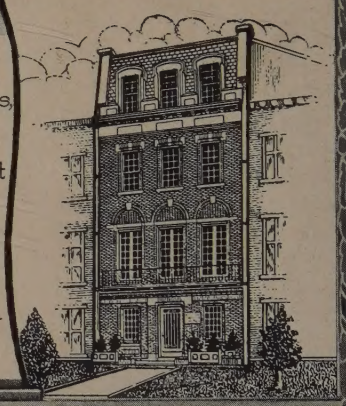

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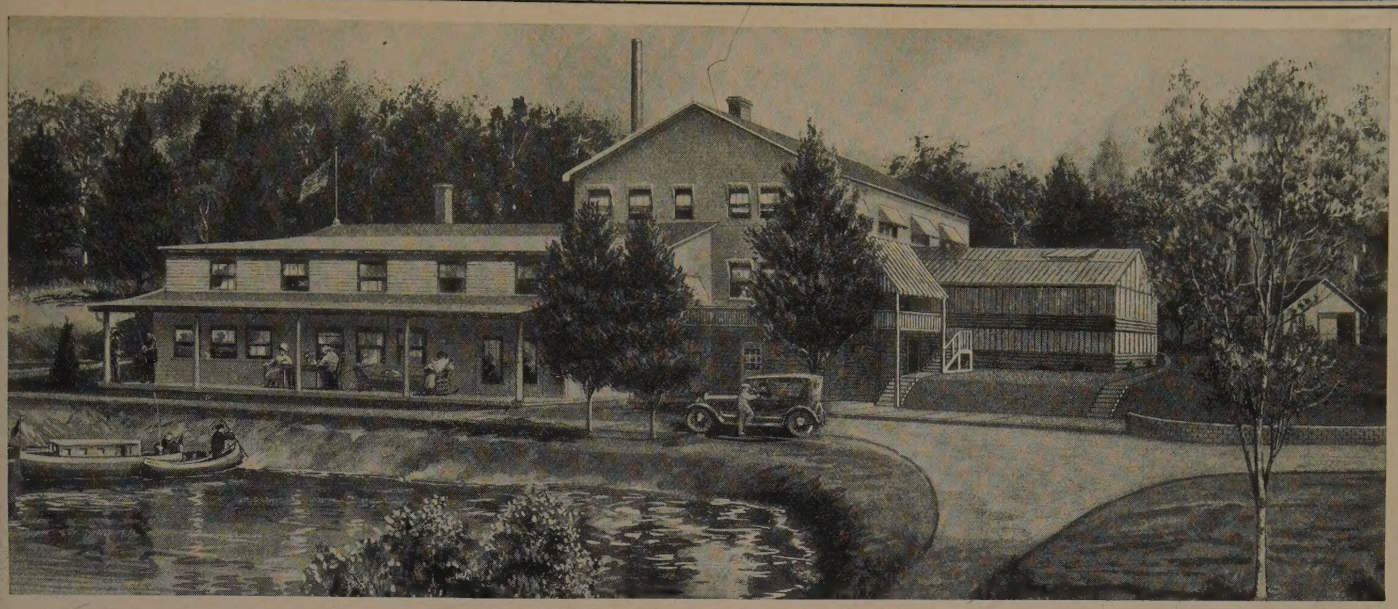

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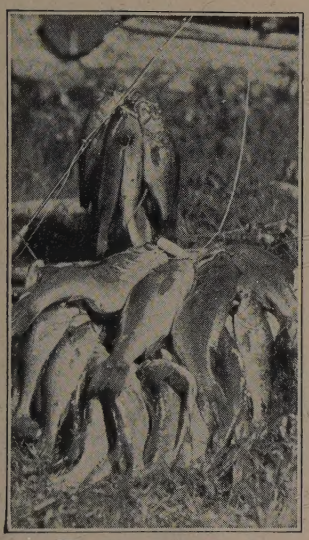

The Morning's Catch

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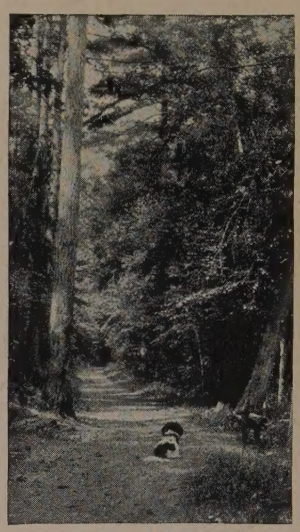

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WAPITI IN SPECULATIVE MOOD

Vol. V FEBRUARY, 1925 No. 2

The snow had begun in the gloaming,
And busily all the night;
Had been heaping field and highway
With a silence deep and white.

—LOWELL.

The Return of the Wapiti

By WILLIAM L. AND IRENE FINLEY

Of the National Association of Audubon Societies

(PHOTOGRAPHS BY THE AUTHORS)

OUR QUARTERS were cramped and the wintry winds fanned through the big open doors. You may ride in a Pullman and stretch your neck as the scenery blurs past, but few in peace time are allowed to sit in the doorway of a freight car with feet dangling and gaze at a motion picture of rivers, forests and mountains rolling by at a speed slow enough to catch the details. At night we spread a mattress of hay on the floor, and I was awakened from peaceful slumber by a young elk poking his nose through the slats and rooting against my neck. He had eaten my mattress and was nudging me to get up and furnish more hay.

We were riding a freight train with a herd of elk, transporting wapiti from the Jackson Hole country south of Yellowstone Park to the pine forests of the Wallowas in the northeastern corner of Oregon where they were once abundant. Two old bulls, seven cows and six yearlings had been selected for the Oregon herd. An ordinary boxcar had been remodeled by building a board partition across the middle by the doors and eight of the younger animals were given a berth in one end. The older ones traveled in the other end of the car, and we took the middle.

SHORN BY CIRCUMSTANCE

Two of the old bulls had to have their horns sawed off to ride in crates.

The correct name of our fellow passengers is the Indian one, wapiti, for the real elk of Europe is quite a different animal, corresponding to our moose. Think of all the Elk ridges, Elk mountains, counties and creeks—our histories and geographies abound with repetitions of the popular name. We may read of the wapiti,

but our children will perhaps always know him best as just plain elk, the largest and stateliest round-horned deer in America.

This big game animal once pastured in the woods of central Massachusetts, roamed south into the Carolinas, west to the Pacific and north far into Canada, so that the original range of the wapiti was wider than that of the bison or buffalo. Old records tell us that the last elk was killed in Pennsylvania perhaps in the fifties, and in Michigan and Minnesota some time in the seventies. Fortunately, their greatest numbers survived in the Rockies, with smaller scattering bands in the Cascade and the Coast Ranges bordering the Pacific.

"BILL TAFT"

The king of the herd brought from the Jackson Hole country.

I sat watching the old bull near me, standing dejected in his cramped quarters. He reminded me of a wild eagle in a cage. It was, indeed, clear that the peculiar charm of the American elk or wapiti comes partly from the rugged scenery of the land where he lives. My mind wandered off to the wide stretches of Big Game Ridge on the roof of the Rockies where the waters of the Yellowstone start for the Atlantic, and the cool springs of the Snake rush off toward the Pacific. I seemed to be standing once again on a tip of the continental divide where I could look out over a vast country, partially wooded, and stretching off for miles in all directions. Although it was the first of August, patches of snow still lay on the north slope. Below me, a herd of fifty elk lay like cattle in a grassy meadow. Over in another direction, a band of thirty-four were feeding along the mountainside.

I was hunting with a camera. We circled to get under cover of some scrubby trees to "shoot" the herd in the little meadow and frightened out another bunch of about twenty. The light-colored hair on their rumps flared out and instantly every animal in the neighborhood was on the alert and suspicious of intruders. Far away on a grassy slope to the north, I counted a herd of about a hundred elk feeding quietly, and, further still, my field-glasses showed more herds and yet more.

What an interesting story this was spread out before me! These remnants represented the last stand of the hosts of wapiti driven back from the very shores of the Atlantic, across the Alleghanies and the wide valley of the Mississippi. For many years it was a question whether they would follow the bison or buffalo to the point of final disappearance. When Yellowstone National Park was established, it was the first step toward the salvation of this great herd. But it was not enough. Necessity made the wapiti a nomadic race. Each fall, the little and big bands bunched and trailed off down the mountains to the south, driven out of the sanctuary of the park by the deep snows that cover these ridges of the Rockies. Thousands gathered in the valley of Jackson Hole as they had done from time immemorial, to feed upon the tall grass, which had matured with the fall and lay as rich pasturage in their winter home. But the settler came, dividing and fencing the valley, and plowing and cropping it. The elk milled around outside wire fences and guarded haystacks which were new to them. By hundreds and sometimes by thousands they starved. Finally, the Government, aroused by public senti-

"SHOT" BUT NOT WOUNDED

Posed for by wapiti, who once enjoyed an even wider range than the buffalo.

ELK CALVES TO STOCK THE OREGON WILD

Youthful wapiti immigrants from Wyoming return to the country where their forebears roamed.

ment, purchased a part of this valley and the elk herds were taken under the guardianship of the Biological Survey of the Department of Agriculture. Then, and then only, did protection of the wapiti begin to appear as an accomplished fact.

A sudden clash of couplings and a lurch of the old boxcar brought me back shoulder to shoulder with this little herd and the responsibility of my guardianship. This strange journey was a part of the return of the wapiti to their old home in what is now Wallowa Forest Reserve in Oregon and it was indeed a story in itself. We had worked out our plan in cooperation with the Biological Survey. In Jackson Hole, a high stockade had been constructed, the hungry elk were enticed into this corral and then driven into crates built on wagon sleds.

All this had to be done in the middle of winter, and the nearest railroad point at that time was St. Anthony, Idaho, 90 miles to the west, with the rugged Teton Range, an almost impassable barrier, between. The outfit of six sleds, carrying the elk, left Jackson Hole on an early morning in March. Additional teams and sleds carried hay and grain for the elk and horses and provisions for the men. Toward noon the sky blackened and soon scattering snowflakes began sifting through the tall pines. The road that had been packed smooth was soon covered with a flurry of flakes flying in the wind. This drifting would make the narrow road dangerous where it led along the steep mountainside toward the pass. But the battle was on.

"We can never make the summit if this keeps up," said the leader as they made camp for the night, but at daylight the procession was winding on toward the top. The storm increased to a blizzard. Teams were doubled up to buck the snowdrifts. The horses

struggled, urged on by the drivers. The snow lay nearly fifteen feet deep through the pass. On a steep, narrow turn, a small avalanche swept one outfit down the mountain, overturning the sled. A friendly tree stopped the crate. It was a narrow escape for the horses and men. One elk lost his life. The party gained the pass, but four days passed before they pulled into St. Anthony, worn out from the lack of sleep and the long fight. The elk gladly stretched their weary legs during the two days' rest in the stockyards before the long railroad ride.

CAUGHT IN A SNOWSTORM ON THE EDGE OF WALLOWA FOREST
Wagons had to be abandoned and rude sleds constructed to carry the crates of elk.

Along the line of railroad travel from St. Anthony, the elk attracted nearly as much attention as a circus. At different stations people crowded around to see the herd, and not the least important feature of the trip lay in the interest it aroused for the protection of the wapiti and other game.

When our train arrived at Joseph, Oregon, the elk were given another chance to rest in a corral before setting out for their future home 46 miles to the north. There, in the northeastern corner of Oregon, near where the country breaks off to the rugged canyon of the Snake River on the East, the United States Forest Service in 1907 had built a five-foot woven wire fence around two square miles of forest. This area, known as Billy Meadow Pasture, had been used for three years to carry on an experiment in sheep grazing, but now all the sheep had been taken out and the pasture had been turned over to the State of Oregon to receive the elk herd.

We had expected to have plenty of snow to sled the elk into Billy Meadows, but warm weather had melted it in the valley. It was clearly not advisable to keep the animals in a pasture at Joseph until weather conditions were favorable, as the cows would calve a little later and then the trip would be even more difficult. Therefore, the elk were loaded three to a crate on five ordinary wagons. The roads were so muddy that it took two teams to a wagon. In the outfit were twenty-one men, nineteen teams, two saddle horses and a necessary supply of provisions.

THEY LIKE ALFALFA
Part of the herd transported to the Wallowa Forest having their first meal in their new home.

No one could forecast the weather. The first day offered a mixture of rain and snow. Plowed up with the tread of horses, the gumbo soil hung thick and heavy on the wheels. In places, the teams were doubled up eight horses to a wagon, and where the mountain grade sloped, guy lines were thrown to keep

the wagons from overturning. The old elk were on their feet continually while the wagons were in motion and they balanced the load remarkably well. The yearlings took the experiment in a more comfortable way. They ate more readily and soon learned to lie down even in the dangerous parts of the journey.

FREE TO STRETCH ITS LEGS

Elk released from crate in which train, wagon and sled journey was made from Jackson Hole.

At the end of two days' hard traveling, we reached the forest boundary only to encounter a driving snowstorm. This meant trouble. With the deepening of the snow, the wagons were useless, so we pitched camp. The men built rough sleds, snowboats, or go-devils, as they are called by the natives. The elk could not be taken out of the crates, so to change from wagons to sleds, we pulled in under a big pine tree, and with block and tackle hooked to a limb we hoisted the crates from the wagons and let them down on the sleds.

Five feet of snow was more than anyone had counted on. A relay of men and teams was sent in advance to buck out a road. The horses floundered, but like the men, they worked with a will and the elk finally reached the pasture fence just sixteen days after they started from Jackson Hole. Nothing showed but the tops of the posts. Since the wapiti were not used to their new home, a patch of about half an acre was enclosed with a log fence eight feet high. The crates were backed up to the small pasture but it took time to get the stubborn animals out of their old quarters. As soon as they were in the open, they lunched on snow. A supply of alfalfa was brought in to last the balance of the winter. Several sacks of oats were brought for the horses, and although the elk would not eat oats at first, but by mixing oats with moss, they soon learned to eat this food from a box just as a horse does.

An amateur photographer had come along to get some pictures. He cheerfully climbed over the fence and set up his camera. The elk were munching hay peacefully, but as the camera man was throwing the cloth over his camera to focus, one of the old bulls accepted the challenge and made a lunge for the intruder. The man vaulted the fence, leaving the camera standing. The elk didn't touch it, but for some time the owner didn't either. After that, pictures were taken through the bars.

The following year, another band of fifteen elk were added to the Billy Meadows herd. Tall grass and browse were abundant in the big enclosure during the summer, but for the first few winters, a supply of hay was kept on hand to keep the elk contented and prevent them from wandering far away. As the years have passed, their numbers have increased. Some of the young animals have been taken out to stock other forests of the state. In 1923, Mr. N. J. Billings, Supervisor of Wallowa National Forest, estimated there were three hundred and fifty in the Chesnimnus region. Nearly all of these summer in the vicinity of Billy Meadows Pasture and there he once counted forty-two head in one band. The wapiti range in and outside the pasture, jumping the fence anywhere they please. Today one may travel through the pine forests of the Wallowas and find elk roaming the mountains just as when Chief Joseph of the Nez Perces and his braves hunted them many years ago. The wapiti can never return to the fertile Wallowa Valley which is now fenced and plowed, but with the growing interest in game protection these splendid animals will continue to hold their own in the wilder forested areas.

Hepatica, Harbinger of Spring

By ALBERT A. HANSEN

ONE OF the curious beliefs existing among the ancient herbalists was that any resemblance of a plant to a part of the human body was an indication that the plant could be used as a cure for disease in the resembled part. Thus we learn, for instance, that on account of the similarity of the shape of the marginal fruits of the dog lichen, *Peltigera canina,* to canine teeth, the plant was a specific for hydrophobia!

It is little to be wondered at, then, that some folks once believed that "liver complaint" could be cured by eating the liver-shaped leaves of our common hepatica. But modern science has absolutely disproved all notions of this sort. It is interesting to note, however, that the generic name *Hepatica,* which means liver, was given to this group of plants by Heinrich Ruppius because of a fancied resemblance of the leaves to the liver.

America boasts of but two native species of hepatica, although the two forms merge so gradually that only the keen-eyed observer can distinguish one from the other. The earlier species is *Hepatica triloba,* and it seems that, as one travels westward, the leaf lobes become sharper and the species is called *Hepatica acutiloba,* although both forms may often be found growing in company either in the east or the west. Strange as it may seem, the sharp-lobed form shows a distinct tendency to separate the male from the female flowers, which is not true of the triloba species.

As every nature lover knows, the hepaticas are among the earliest of our woodland wildflowers. Fuzzy little buds unbend in the wake of the melting snow and fragile blossoms seem to throw off their fur overcoats soon after the dainty arbutus has blazed the floral trail of the season. And what variable things these handsome little blossoms are! Pure white or lilac purple, odorless or with faint, sweet fragrance, one can find sufficient variation in a single patch to suit almost any fancy. The greatest appeal of hepaticas lies in their delicacy of both color and fragrance. Neither pungent odor nor blazing color ever mar the modesty or charm of this dainty woodland flower.

As with practically all colored blossoms, hepaticas entertain numerous insect guests, ranging from the pollen-devouring flies and ants to the more gaudy nectar-eating butterflies. The variety of insect visitors is perhaps a little strange, since hepatica flowers do not seem to possess nectaries, although it is possible that the nectar may be secreted by other means.

A SINGLE PLANT IN FULL FLOWER

The name Hepatica refers to a fancied resemblance of the leaves to the shape of the liver.

In spite of its enticing beauty, hepatica is fairly well protected against the flower vandal who picks blossoms thoughtlessly and promiscuously with no regard for the future. Its protection lies in the perennial roots, which continue to live year after year even though the blossoms be freely plucked. Occasionally it happens, however, that the overzealous flower gatherer ignorantly pulls out roots and all, and the plants are thus destroyed forever. Picking the blossoms alone does little harm, although the flowers soon wilt and droop and become dismal and forlorn in appearance. Hepaticas, as are most woodland wildflowers, are far more attractive in their natural haunts than in wilted and dejected bouquets.

The cultivation of hepatica in wildflower gardens and under similar artificial conditions presents a mystery to many. In general, success in growing wildlings is usually attained by simulating natural conditions as closely as possible. It would be a mistake, for instance, to attempt to transplant hepatica from shady, moist woods to a dry, sunny border. Far better transport woodland soil to a shaded place and there plant this early spring floral gem.

Bird Guests in the Winter

By ERNST KEIL

(PHOTOGRAPHS BY OTTILLIE AND THE AUTHOR)

WINTER with its hardships for our friends in birdland is, above all others, the season when a helping hand is most appreciated by those plucky little creatures willing to brave snowstorms and zero weather.

When the leaves on bush and tree turn to somber autumn colors, the birds, in a mighty wave, begin traveling towards the equator, and as the summer visitants gradually disappear our feathered friends who cheer us during the long winter months become more in evidence around our homes. They have dutifully responded to Nature's call to go forth and multiply, and now, as their families are self-supporting, they make their way from the deep woods and retreats where they have nested towards their winter stamping grounds—about the homes of kindly people. Nuthatches, as a rule, are the first ones to bob up; they come a little early, to be sure, but it won't do any harm to be on hand—first come, first served you know; this earthly rule holds good in birdland as well. Expectantly they explore the well-known places; the mess-table, which a kind-hearted friend fills several times during the day with scratch feed and leavings from the table, is given first attention. The screened tray filled with beef-suet is in the same old place, and the little cup on the top of the post to which the mess-table is fastened is there, too. This little cup has, in the course of a day, more callers than any other utensil on our feeding station, for it contains from time to time a real luxury, peanut butter, dearly beloved by all the big and little gourmands in feathers. Even the basin with the drinking water is not missing, so all seems well and no reason to worry, just let the winter come.

For several years a pair of Cardinals and a few Blue Jays have remained about our premises, summer and winter. The Cardinals are a truly devoted couple and seem to be mated for life. What a charming lover that fiery red fellow is, he adores and protects his lady fair during the winter months as ardently as during the nesting season in spring and early summer.

TUFTED TITMOUSE

The surprised look is because the peanut butter dish is empty.

When the ground is covered with snow and the trees stretch their leafless arms towards a sky heavily laden with dark clouds, what a cheerful sight is a frisky Jay flitting about in his trim livery of blue and white, just as if a piece of lovely blue sky drifted below the clouds. Usually several Blue Jays winter with us, and the boldest among them is one we call Harry, a big and handsome fellow, full of mischief and deviltry but, in spite of all his shortcomings, our favorite. Harry, with all his daring, is extremely cautious, but he "will try anything once," as the say-

IN SEARCH OF FOOD

Whitebreasted Nuthatch out prospecting for something nutritious.

ing goes. We often succeed in coaxing him through the open door halfway into our front room. The way to allay the fear of wild creatures is through kindness mixed with something that promises to tickle their palate. Taking advantage of that fact we tempt friend Harry with a row of peanuts, starting on the front porch and ending in the middle of our living room. Those on the porch are gobbled up with much glee and in rapid succession, but the ones lying inside the room are approached with ever-increasing caution. For the last two or three we must sit perfectly still and make no motion, and even at that Harry makes several attempts before reaching his goal.

HARRY, THE BLUE JAY

The tail end of a peanut is just disappearing to top off his meal.

By the time the first snow comes whirling down our feeding station has its full complement of boarders, and a cheerful lot they are, happy and carefree. They know there will always be enough fuel in the form of food to stock their hungry tummies, and water for drinking is also on hand; cold, even zero weather, has no terrors for them as long as they find enough to eat. A protected, snug resting place for the night is easily found in a hollow tree, on the rafters under the porch roof, or in a brush pile. Winter is the ideal time to study the characteristics of the individual bird. During the summer birds live in pairs and are kept busy attending to their family affairs, but during the winter it is each individual for himself.

FIRST COME—FIRST SERVED

Chickadees are never missing from the meal time when the table is set.

The Hairy Woodpecker is always shy, for ever on the alert, and craning his neck in every direction to make sure no danger is lurking near before he settles down to a meal of suet. Occasionally, after he has had his fill he will remain for a few moments to fluff his plumage and bask awhile in the sun, but these are rare moments, and, as a rule, he departs as soon as his meal is finished. Very seldom does he pay any attention to the foodboard; suet is his dish, and if he finds the tray empty he grows emphatic in denouncing our neglectful ways in a high-pitched, penetrating voice.

How differently behaves the Downy Woodpecker. There is not much sentiment in his make-up; he is the most matter-of-fact bird one can imagine. He is careful, but, once convinced that he has nothing to fear, he makes himself at home and acts as if he had a perfect right to be on the premises. If there is no suet in the tray, he will fly to the dish with the peanut butter; if that happens to be empty, too, his next stop is at the foodboard to sample the bill of fare there without much complaining. However, suet is his mainstay, and if it happens to be missing for half a day or so he proclaims his disapproval with noisy enthusiasm. First he protests from the suet post, and if that fails to produce the desired results he settles on a window-sill or on a porch post rolling his drum and calling his famous "git," shouting to all and sundry that he feels sadly neglected. There is something winsome about that

trim little fellow of the woodpecker tribe. We never see him display overbearing manners or gluttony like the Blue Jays. If he comes for a bite of suet and finds somebody else busy on the post, he stops in a nearby apple tree and starts with great industry to search for insect larva hidden in the bark. In case the other fellow stays longer than Downy considers good form he will eventually fly to the suet post, gently remind the greedy diner that he is holding up the parade and that it is time to make room for a starving Downy; but all this is done in such a friendly sort of way that one cannot help but admire his gentleness and patience. He recognizes the friend who supplies him with the things that hold body and soul together, and he is thankful in his own way. Although the rattle of the focal plane shutter in the Graflex camera annoys him just a trifle, he lets that friend approach him within four or five feet to take his picture without even as much as uttering a single "git."

THE HAIRY WOODPECKER

He's cuddling close to a meal of suet with a wholesome appetite.

Among the woodpeckers that come, both summer and winter, to visit our feeding station is a female Redbellied Woodpecker. This bird is about the size of a Flicker, perhaps a little more slender in build. Although we have been unable to locate her home, we know she raised a family nearby every summer during the last two years, for we have seen her carry food away regularly during the nesting season. The strange thing about this beautiful visitor is that, during the two years she came almost daily to our feeding station, she never once brought her mate along. This handsome bird remained always very shy, often fussing around for an hour before settling down to a meal. Last year, about the middle of January, she suddenly disappeared and has never been seen about our place again, to our great sorrow. A cat, a hawk, a weasel—who knows? The enemies of our birds are so numerous.

CHIC AND "FRENCHY"

This spry and interested little lady is a Tufted Titmouse.

In early fall the trim Nuthatches appear and, without much ceremony, open up winter headquarters. What a dandy dudish fellow the White-breasted Nuthatch is, and not over peaceful; at any rate he is quite "sassy" and uses his pointed bill to good advantage when occasion demands. The English Sparrows are the birds with which he comes most often in collision. They will take a chance to pick on him, no doubt, because he is about their size, but they invariably find him far from "easy picking," and when, with half raised, quivering wings and angrily quacking voice he turns upon them, they have the surprise of their lives. The White-breasted Nuthatch has a way all his own in navigating a tree trunk, and, whether going up or coming down,

he always travels with his head leading the procession. He seems to be endowed with a particularly loose and limber joint in the middle of his neck, enabling him to bend his head nearly at right angles to his body, which is no doubt of considerable value to him for observation purposes, and to make sure that the joint shall not lose any of its nimbleness he exercises it on all occasions. To say his neck is as loose and limber as his disposition is no exaggeration. Like all the little wild creatures that come to our banquet table, he is on the most intimate terms with us. Sunflower seeds and peanuts are his favorite morsels, and his way of delecting himself is as quaint as his way of slipping down a tree trunk head first. The seed or peanut he selects is carried to a tree, where he wedges it into a crevice in the bark; then he proceeds to chisel it open to get at the sweet meat within the shell. A big gnarled oak tree in our yard is over an area of nearly two square feet, thickly decorated with empty peanut and other shells bearing evidence of many a joyful feast and the quaint way of a Nuthatch consuming his dinner.

DOWNY WOODPECKER FINISHING A MEAL

He has not had time to clean up for suet is still clinging to his bill.

Chickadees and Tufted Titmice make their debut a little later than the Nuthatches. Being the smallest of the flock of winter visitants, our sympathy quite naturally goes out to them in a greater measure, for in breasting the inclemency of winter weather these tiny birds have a far harder struggle to survive than their bigger and more rugged brethren. But, in spite of the tremendous odds against them, they are a jolly lot. The most cheerful is the Tufted Titmouse. Although she is garbed in a dress plain and demure, her disposition is joyous and sunny. For a small bird she has a remarkably strong and full voice, and especially her whistle is loud and pleasantly modulated. While always joyous and happy, her delight reaches a state of mild ecstasy when, with enthusiastic exclamations, she views the foodboard loaded with all sorts of goodies. Far from being a glutton, she delights in seeing a table lavishly set; I know she is an epicure at heart. Her joy over a full banquet table is only exceeded by the thrill it gives her when she has a chance to select the largest peanut for herself; just like a child in that respect and very human. "Ohhh see, See SEE," she repeats over and over as she flutters up and down in excitement at the edge of the foodboard, undecided what to select. Rarely, if ever, do I see her in dispute with other birds; she rather leaves the table when the others get too rough and, perching at a nearby point of vantage, tells them a thing or two about their lack of manners. When delivering such a lecture she always raises the "pompadour" on her head, apparently to give her utterances greater weight and dignity. When we sit and watch her, we often delight in fancying she migrated to us from sunny France, perhaps direct from gay Paree. She is so charmingly feminine, so graceful, elegant and chic, a creature as happy and lovable as a child.

As a subject for the colored insert for the March issue Mr. Horsfall has chosen the Western Gull, that floats, swoops and sails over the sea and shore. The artist has invested the painting with all the grace of this bird, and the colored insert is a fit companion for the Elk of this month.

The Collie

By ALBERT PAYSON TERHUNE

OUT OF the swirling murk and fog and mystery of the Scotch highland moors, he trotted first into the limelight. At that time he was jet black and curl-haired and little more than half his present size.

Because of his color they called him a "coalie." Old Scotsmen still are to be found who stick to this ancient pronunciation of the collie's ancestral name.

Many another dog—the Dobermann, the Boston, the Airedale, etc., is a scientific blend and evolution of several other breeds. But the collie has evolved from himself alone, so far as the deepest delving can find out. He trotted into view many hundreds of years ago, in Scotland. Since then his history and his development have been direct. But—

Well, one of the statues in King Tut-ankh-amen's tomb was that of the monarch's favorite dog. I showed a photograph of this to a man who knows nothing of Egyptology, but who knows collies as it is given to few to know them. I asked him what the stiff-carven dog's breed might be. He answered vehemently and at once:

"There's not a scrap of doubt to it. That dog's a collie. He can't be anything else. There are lines to him that no animal but a collie ever had."

I give his dictum for what it may or may not be worth. I make no comment on it.

Perhaps the collie had the same ancestors as did several shorter-haired and less alert dogs. Environment does much. If ever you have watched a collie at work among the vast and almost inaccessible distances of a Scotch mountain range, you know that his daily life-long work involves tremendous exertion and the hourly exercise of brain. Countless centuries of this sort of thing may have evolved him from some lesser type to the wise and wiry specimen of today. That is Bennett's theory, not mine; but it seems justified by every rule of evolution.

When mankind undertakes to make a pet of a working dog, the result is liable to be much the same as when a mischievous three-year-old child gets hold of a bit of priceless eggshell china. Queen Victoria, as a girl, proclaimed the dashingly sage little collie, or coalie, her favorite breed. At once Fashion snatched him up and began to develop him.

"BRAINS OF A MAN; WAYS OF A WOMAN"
This is the olden Gaelic proverb descriptive of the collie.

The curled black coat was modified into several other colors, sable predominating. The thick head with its wide brain-space and round eyes was lengthened by discriminate breeding, and was modeled to the present form. The eyes became small and darker and slightly slanted. All this without destroying the collie's uncanny mind or lessening his speed and endurance and gay courage. Then Fashion went further by decreeing a head still longer and narrower and

"THERE IS AN ELUSIVE MENTAL AND PSYCHIC QUALITY TO THE COLLIE"
He is easy to spoil and wrong treatment in puppyhood often ruins him.

placing more stress on luxuriance and harsh straightness of coat than on intelligence.

For a moment the future of the collie hung in the balance. They were "breeding out his brains through his nose." They were making him a beautiful, useless weakling. Then it was that a few wise fanciers rebelled against this desecration. By

OLD SCOTSMEN CALL HIM "COALIE"

This is the ancestral name sometimes heard pronounced with the Highland burr.

shrewd breeding and by education they were able to swing the collie back to what nature had made him. More and more, every year, the best fanciers are insisting on stamina and sense. More and more judges are giving championships to dogs with a preponderance of these traits. The tide has turned. The collie is saved. Back he has scampered to the point where again he merits the olden Gaelic proverb: *"A collie has the brains of a man and the ways of a woman."*

There is an elusive mental and psychic quality to the collie which I have not found in any other dog. Sensitive, nervous, high-strung, bewilderingly clever, he is as easy to spoil and to make worthless as is the delicate mechanism of a thousand-dollar watch. Wrong treatment in puppyhood too often ruins him. As in the case of a highly developed human, a worthless collie is more supremely worthless than is a worthless specimen of any other breed.

On the other hand, give a collie pup the right treatment—use sanity and patience and gently firm commonsense in his upbringing, and you will find yourself the owner of a dog unequaled for every trait that endears dog to man, a dog worth the pay of any hired man on a farm, a staunch guard of the home, a gloriously congenial chum. By careful training, even a spoiled grown collie may be brought back to something like his normal heritage. Twice I have trained supposedly incorrigible grown collies into splendid guards and comrades. But it was a patience-wrecking task and one I would not undertake again. It is easier to mend a broken wheelbarrow than a smashed radio set.

Whenever collies are discussed among people who

STAUNCH GUARD OF THE HOME

The collie is worth the pay of any hired man on a farm.

know nothing, there are two sentiments certain to be aired. One is: "Modern collies of the show-type have no sense." The other is: "Collies are treacherous."

Both these statements are unqualifiedly false. I

MR. TERHUNE AND TWO OF HIS PALS

Better the least good-looking collie that is an ideal chum than the costliest show-specimen lacking all the traits a collie should have, he says.

say this with nearly a half century of collie experience behind me, and on the authority of collie breeders who are wiser than I.

In Scotland, and in California as well, I have seen the finest types of show collies herding sheep with a skill that was all but miraculous. Among my own show collies and those of my friends, I have come upon instances of brain-power that were almost human. Take any animal (or any child, for that matter) and keep it in a pen, on balanced rations, treating it as you would treat a prize pig; and you cannot expect it to show much mental development. Too many show dogs of all breeds are kept thus, collies included. Give them a chance, and they will exhibit the brain that is their birthright.

As to treachery, I cannot say, offhand, how many collies I have raised and owned. But the number must surely exceed five hundred in all. I have handled hundreds of other people's collies. In all that number I have not found *one* which I considered treacherous, nor to whom the dictionary definition of "treachery" could be applied.

CONGENIAL CHUMS

"Unqualifiedly false," is Mr. Terhune's answer to the charge that collies are treacherous.

True, I have known collies of uncertain tempers and collies whose bad temper admitted of no uncertainty. I have known a few stupid collies and a few cowardly collies. The average of bad-tempered or stupid or

(CONTINUED ON PAGE 134)

The Forest Primeval

By ARTHUR N. AND ELEANOR PACK

"THE LAST blazes were clearly pointing in this direction, but where is the trail?" A naturalist, an editor and an assistant editor sat down to rest and talk it over. Over them towered a great Douglas fir, its trunk five feet in diameter, its nearest branches over one hundred feet above. The voiceless murmur of the forest seemed to accentuate the stillness. "It's just two hours since we left tide-water; how far do you think we've come?" The editor had once covered the ground before and knew a little of the country. "Almost a mile," he replied. "There are 20,000 square miles in this particular belt of virgin forest and 40,000 square miles we can also reach. How far do you want to go?"

Since nine o'clock the little party had struggled as best it could along the line of blazes left by some fur trapper several years before. It was a typical bit of British Columbia coastal forest, with Douglas fir two or three centuries old predominating. There were western red cedars, too, that were at least contemporaries of the fir, tall hemlocks and balsams finer than ever grew in the woods of New York or Pennsylvania. Not one man but who would take back with him a mental picture of great trees glorified—a mental picture only, for no camera ever made could catch the full length of trunk amid the overpowering grandeur of surroundings. Let the photographer stand over there across the valley—no, the camera finder sees but a confusion of trunks peeping through the maze of new growth and underbrush. Get an axe and clear the way—it would take a well-equipped logging company a week to clear the vista, and then—and then all is spoiled.

A MONARCH RECROWNED

New tree growing from a sprout rooted in an ancient stump.

The assistant editor hitched his shoulders uncomfortably and proceeded to rake nearly a handful of hemlock needles from inside his shirt collar. "Here I've got enough browse to make up a bed for the night," he growled, "to say nothing of a nursery full of fir seeds. They seem to be falling out of the cones and picking on me as an embryo tree planter."

"Well, that's what you get for always writing about it," chuckled the naturalist. "You might as well carry them out with you, for they won't grow in this shade. Didn't you notice there were nothing but young hemlocks, balsams and cedar seedlings all through here? Over on the other side of the bay, where that strip had been logged, the fir was coming up again in great shape, because there was plenty of light. Even the fire whose scars we saw on the stumps hadn't destroyed the seeds which the chipmunks probably buried the year before, and it doubtless helped the process of reforestation. Of course, if fire ever gets

FOUR GENERATIONS TOGETHER

Massive trunk of thousand-year cedar amid younger trees and over fallen companion whose rotting trunk is a nursery for new seedlings.

in there again it will be good-bye forest once and for all.

There was a silence broken only by the distant murmur of the creek somewhere off to right and the occasional rattling call of a kingfisher discussing the prospects of a fish dinner. Tired limbs relaxed on the deep carpet of needles.

"The British Columbia Government certainly has the right system for protecting its natural resources," remarked the editor. "Nearly all the timber in this country is mature. Economically speaking, it ought to be cut by degrees, and that is just what is going on. But the government has sold only the right to cut, and keeps the ownership of the land itself to promote reforestation. Every holder of a cutting license has to pay certain fixed annual dues which correspond to taxes and must contribute half of the cost of fire patrol. When he does log the land the government measures the logs and collects so much per thousand feet of timber in addition, but as this rate is based upon the average selling price of logs the operator still has a chance to make a fair profit. It is very like the way our own National Forests are handled, but, outside of Alaska, the United States Government owns only a very small percentage of the total productive forest area."

"Mighty good plan," the assistant editor concurred, "but say, if we had to spend the night here, how in the deuce could we ever get any dry firewood? This undergrowth is quite damp and it would take the three of us a week to cut down one of those leviathan trees, unless you two are better axemen than I am?"

For answer the naturalist took up his axe and swung it easily at the base of the great fir, knocking off the outside coating and revealing a thick, reddish inner bark. "First lessons in western

A PRETTY SHRUB WITH EVIL THORNS

The Devil's Club is worthy of its name. Lurking in patches on the forest floor, it tempts touch and rewards with poisonous jabs.

woodcraft for eastern tenderfeet," he announced. "This stuff makes wonderful fuel and actually burns more readily and more slowly than wood. We keep this little trick for ourselves, however, because if the automobile campers in Washington and Oregon ever got on to it, every handy fir tree in the states would soon be stripped. Pioneer prerogatives, you see. Here's another one." This time he sank his axe helve deep in a fallen log covered with moss and sprouting seedlings of hemlock. Once, twice he swung, splitting off a good-sized piece. Inside the heartwood was as sound and strong as ever. "This is western red cedar, the cleanest wood you ever tried to split," he said. "The trappers split boards or 'shakes' out of it with nothing but an axe, and with them they can both build and shingle a first-class cabin."

"Sure, I know," the editor put in, "that's the wood most of our shingles are made from, even in the east. And don't you remember, we saw that Indian squaw at Alert Bay weaving the long, tough shreds of cedar bark into mats? Cedar is in many ways my favorite tree in this country. Look at those long drooping limbs over there like illustrations for James Oliver Curwood's stories. In the woods of the fog belt farther up the coast, where cedar predominates, the trunks for some reason break off at right angles into many steepled crowns. Then these steeples die at the top, and when you look at them from a distance it's as if a thousand hoary arms stretched imploringly to heaven."

SHINGLES IN THE RAW
Typical tree of northwestern forest from which comes roofs.

Presently the three explorers again took up that uncertain trail, threading their way amid the infinite rubbish of a windfall where some giant fir had come crashing to the earth, bearing before it every smaller tree within

(CONTINUED ON PAGE 105)

UNDERGROWTH OF THE PRIMEVAL FOREST
Shoulder-high thickets of ubiquitous salal, a giant relative of our innocent wintergreen, making progress slow and difficult.

MIKE, LIKE IKE

Turtles and So Forth

By RICHARD W. WESTWOOD

TERRY, TILLIE'S TWIN

MIKE slid aimlessly off the rock and plunked into the water, disturbing Ike's slumbers. Terry and Tillie, moored down in the corner of the glass tank, apparently dozing also, stirred and stuck out their striped necks to observe the cause of the disturbance. Mike commenced to dig himself into the sand at one end of the tank and the others lapsed again into midday siesta.

Mike and Ike, so named because they look alike, are snapping turtles, boasting only two months of life in this man-ruled world. Terry and Tillie are painted terrapins, named respectively for short and for euphony. They, likewise, are two months young. All four migrated in a candy box and via the Pennsylvania Railroad from Wilmington, Delaware, to this editorial sanctum. More specifically, they came from the back yard of Mr. Cecil C. Hahn of that city; and thereby hangs a tale worth the telling.

PHOTO CORNELIA CLARKE

YOUNG SNAPPERS OUT FOR A STROLL

The youngsters are harmless in their immaturity, but some day they will bite and bite hard.

The central theme of this tale is Mr. Hahn's conviction that unless the propagation of the snapping turtle is given a helping hand by man it will become as rare as the famous diamond-back terrapin. This is a debatable question among authorities, but it doesn't alter the fact that Mr. Hahn's turtle "growing" is interesting in itself and in the conclusions it offers.

Growing is the word, for one warm day after a soft late summer rain, we saw turtles grow. We saw them stick black, snubby noses up out of the moist soil. We saw them work their square inch or so of turtlish body—sometimes still stuck to a bit of rubbery shell—up into the daylit world. Individually and collectively they took a speculative look at the world and were prepared to start out on their own to meet it. This was in Mr. Hahn's back yard, where he had "planted" 600 eggs and from which 530 small snappers emerged as a crop.

"Hatching snapping turtle eggs requires little or no experience," says Mr. Hahn, reassuring those who might hesitate to embark on the enterprise of raising a turtle crop. "All you need is a bottomless, boxlike form, filled with light loamy soil placed where the sun shines the greater part of the day. It is best to cover it with a fine mesh screen so that turtles who happen to hatch at night will not roam away.

"To obtain the eggs I remove the egg sack of the female snapper by an incision in front of the back legs. The eggs should be left in the sack until they are to be put into the ground and not exposed to the air for long. Cover the eggs with about two inches of earth packed lightly, and then indulge in ninety days of patience for results."

Perhaps our eyebrows lifted at the description of obtaining the egg sack. In any event, Mr. Hahn took up the point:

"There is no way of removing the eggs by pressure and a snapper will not lay eggs in captivity. I have known then to die with eggs in them rather than lay them. But really my reason for taking the

EGGS OF A SNAPPING TURTLE

These are about an inch in diameter and will bounce like a rubber ball without breaking.

eggs for incubation is because I do not believe that ten per cent of the eggs laid by a snapper ever hatch. She uses very poor judgment in laying eggs, always crawling out where possible to a cultivated field such as a corn field. Corn at this season is about a foot high and when the farmer comes along cultivating away goes a crop of turtle eggs."

We were profoundly ignorant of the habits and haunts of the snapper, so we led Mr. Hahn back to the background. We ventured the assumption that his name came from his jaw action and were confirmed in the suspicion. In fact, Mr. Hahn said that he had known of a snapper's head to be severed from his body and yet his jaws to hold fast to a stick between them. We also found out that the males of the species are prone to indulge in dire combat over the females of the species, testifying to an intelligence you would never expect from looking at them.

"The snapper is a rugged fellow," Mr. Hahn continued. "Disease does not worry them and serious injury will not kill them. I have seen them minus a leg or tail, or with shell crushed. The snapper, unlike most turtles, lays a round egg, white in color and about an inch in diameter. It is covered with a tough, leathery shell and can be bounced like a rubber ball without breaking. They do not begin to lay eggs until they have reached a weight of three pounds, or about 15 years of age.

"Like all other turtles, the snapper hibernates during the winter months, but unlike most other animals who hibernate it comes out of the winter quarters fat and healthy. In this section it leaves its winter home the latter part of April and throughout May. You will find it crawling along mud flats where the tide ebbs and flows. The female crawls out to lay eggs about the first two weeks of June, leaving the water and seeking fields high above to lay them. I have known them to crawl several hundred feet to find a place to their liking.

"In laying its eggs a snapper first digs a hole in the ground to a depth of five or six inches, digging with its hind feet and not its tail, as some people think. The eggs are covered with dirt and the surface is packed down by the turtle's rising on all fours and letting the body drop with its full weight. Then the snapper departs."

"Then these little shavers have to fend for themselves from the start?" we asked, pointing to a wriggling basin of day-old snappers.

"Yes," our friend the turtle fancier replied. "Many young snappers are eaten by the common rat and other animals on their way to the water. Fish, frogs, snakes, cranes, night herons and ducks consider the youthful snapper a delicacy. I keep my turtle youngsters all winter in a tub of mud and water so they will be stronger and better able to take care of themselves in the spring."

A CROP OF SNAPPERS

The young turtle has to fend for himself from the day of its hatching.

Thinking of the indictment of the snapper as one who preys on fish and ducks, I asked about the menu of the turtle. Not that the little square inch of turtle crawling around on our hand would bother any trout or canvasback.

"They don't live entirely on fish and other flesh," Mr. Hahn insisted. "Their food consists mainly of the leaves and seeds of the different grass-moss and aquatic plants found in fresh-water ponds and streams. I have examined stomachs and found cherries, and I think they will eat any kind of fruit that should happen to fall within their reach."

(CONTINUED ON PAGE 135)

Red Twigs and Yellow

By STEPHEN F. HAMBLIN
Director, Harvard Botanic Garden

IT IS in winter that we look for spring, and even the bare leafless twigs show signs of sap return by their brighter colors long before the buds begin to burst. In our cultivated landscapes bright winter twigs are considered one of the fine touches, one of the most desirable of the color values. Though many cultivated shrubs with special winter color of twig are introduced plants, there are several wholly American that brightened our winter fields for thousands of years before the white man came, and now adorn our yards and homes.

Though some red twigs we see may be European willows, the most common red-barked shrub is some species of Cornus (Cornel or Dogwood). Willows have alternate buds and a most bitter taste; Cornus has opposite buds — in pairs—and a taste not bitter though not very satisfactory. The Red-osier Dogwood (*Cornus stolonifera*) is widely distributed through the swamps and stream margins from northern Canada to the central states. Any trout fisherman who has not tripped over its tangled stems must have been watching his step most carefully. From fall of leaf in October to new leaves of May this shrub is a blaze of dull crimson twigs, most intense when the sap begins to return in March and April. Its one peculiarity is its habit of trailing its branches on the ground and rooting again in the muck, making an endless jungle of stems. Other species of Cornus are more erect, and even this in Colorado is much less tangled (var. *coloradensis*), the branches strongly curving upwards.

Strangely, another species, a true twin, was created in Siberia (*C. alba*) and is more common in gardens than our native species. It is more erect, but scarcely different in winter effect. In summer there is little difference, yet the oval leaves of the Siberian species are broader at the base, while the leaves of our native plant are pointed at both ends, and, when folded crosswise, the two ends are alike. The botanists say that *C. alba* has a stone in the fruit higher than broad, while ours has the stone broader than high, a valuable thing to know. Both have flat clusters of small, white, 4-parted flowers in May, the basal disc of our flower red, and of the Siberian yellow, and the blue-white berries in midsummer are identical. Our plant usually blooms a second crop in August, but the Siberian species is more cultivated, even running to variegated leaves. Either is good for red win-

PHOTO J. HORACE MC FARLAND CO.

VIRGINIA ROSE

In winter it makes shining thickets of bright red but scratchy twigs.

ter twigs, the Siberian for more neat results near the house, and ours for wild effects at a distance or overhanging water.

Someone found a plant of our native with golden yellow winter twigs, Goldentwig Dogwood (var. *flaviramea*), and it now disports itself in garden and park with the two red ones. A well-known

PHOTO J. HORACE MC FARLAND CO.

ROSA LUCIDA IN BLOOM

The pretty summer dress of this rose is transformed to red twigs in winter.

nurseryman introduced it to the trade. So bright a color cannot be matched in any other winter plant, save a willow, and it is far more striking than the red ones. These two sorts give winter cheer when snow is deepest and bright berries are gone from many shrubs. In summer they are merely presentable shrubs, the twig color dull and hidden by the foliage. They are very easy to grow in any moist soil and may be raised from cuttings as easily as any willow.

One failing they have, a very sad fault. In the wild or cultivated state they are often well covered with some of the scale insects, as the oyster-shell and the ubiquitous and iniquitous San José. Many twigs are dead and black, but new twigs spring eternal from the crown and feed new scale generations. Pruning of dead and infested wood helps to keep the shrubs healthy, but the only cure is a complete bath of lime-sulfur every second winter.

Other red-twigged species of Cornus were created, but rarely are seen cultivated. *C. baileyi* looks like the Siberian, but the leaves are very white woolly below and the flower cluster woolly. It is wild in the Great Lakes region and in winter looks like the other species. Other species, as *C. amomum, C. rugosa, C. asperifolia,* have reddish twigs, but not so dark, and they are not so useful for dooryard winter color.

Another group of red winter twigs are some of the American wild roses. Save for some Chinese species, ours alone have deep red winter bark. The

PHOTO J. HORACE MC FARLAND CO.

RED-OSIER DOGWOOD

One of the group whose red twigs distinguish them as winter decorations.

most common rose is the Shining or Virginia Rose (*R. lucida,* now labelled *R. virginiana*). This makes thickets three feet high or more of bright red, very scratchy twigs along roadsides, through fields and at edges of swamps. The sharp curved, or straight prickles are in pairs at each bud, and they will tear you if they can. It grows from Canada to Pennsylvania. They are to be admired from afar, and walked around respectfully. All our wild roses with red winter stems are much alike in June bloom, and

(CONTINUED ON PAGE 134)

Penguins, Birds of the Antarctic Seas

By EDWARD A. PREBLE

PENGUINS are strange and fascinating birds, forming one of the most remarkable groups in the world. Dwellers in the southern hemisphere, since early geological times, they have developed into many species with differing habits of life enabling them to live in climes ranging from ice-clad Antarctic lands to islands in the shadow of the equator. So completely flightless that naturalists are not yet agreed whether they have lost their power to fly or have never possessed it, they make up for this lack by marvelous skill as swimmers and pedestrians. Some of them are able to live in a climate the most rigorous on the globe, and, moreover, to bring forth and nourish their young in the cold and darkness of its half-year-long winter.

The early explorers of their haunts brought back tales of their remarkable habits so much embellished with flights of imagination, or else so near the truth that they seemed incredible. During late years, however, the various expeditions under Shackleton, Scott, Mawson, and others have cleared up many doubtful points regarding the wonderful social customs of these intensely interesting birds.

The commonest and most widely distributed of

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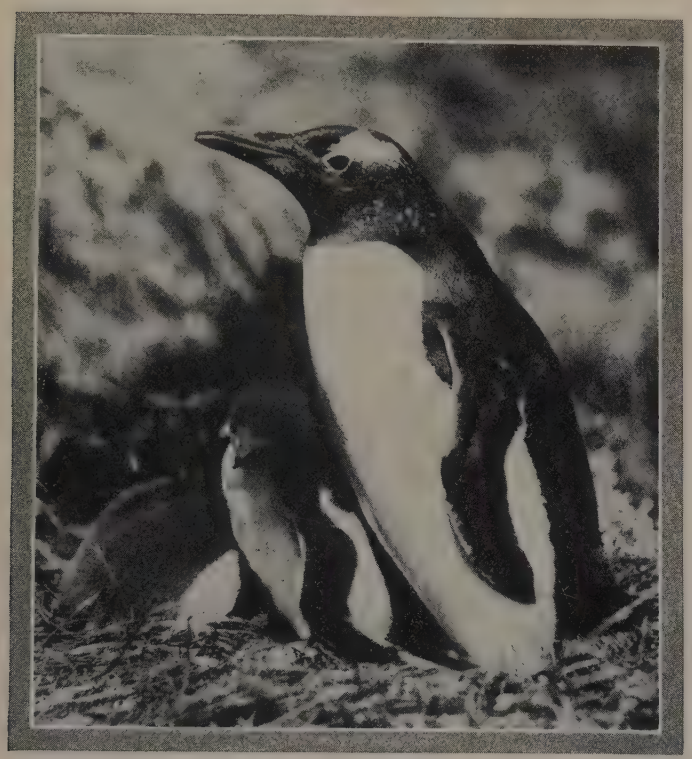
IN SOLEMN CONCLAVE ASSEMBLED

Royal Penguins on the Macquarie Island beach near the wreck of the *Gratitude*. These dignified birds love to parade.

all the penguins is probably the Adelie (*Pygoscelis adeliae*). From whatever direction one approaches the Antarctic Continent this species is sure to be encountered. It congregates in immense colonies to breed, the rookeries sometimes containing hundreds of thousands. Like several others of the smaller species, these birds prefer elevated ground for their nesting, even though their flightless condition forces them to travel long distances on foot between their nests and the sea, where all their sustenance is obtained.

In Adelie Land, where the photographs of this



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GENTOO, OR JOHNNY PENGUIN

This species nests where it is possible to gather stems or coarse grass to protect eggs and young from rocks.

species were taken, the birds came to their nesting grounds in October, at the beginning of the short Antarctic summer. Small pebbles are the only nesting material and there is much competition for them, especially at first while the rocks are still only partly bare. For although summer is coming, winter is just going, and snowy blizzards still rage at times. Then the birds must cease their nest-building and crouch in the shelter of some friendly rock until they can resume work. Finally, as the season advances and the days grow milder, each pair succeeds in building the little pebbly hollow which is to serve for a nest, and the two, or, rarely, three, greenish-white eggs are laid. Then begins the long incubation period, shared alternately by the parents. Never must the eggs be left alone for fear of being chilled, or eaten by the skua gulls, which at this season live on the spoil of the penguin colonies. So one bird broods the eggs while the other makes the journey to the sea to fish.

The eggs hatch in about five weeks. The newly hatched chicks are covered with grayish down, and during their early life are, of course, closely brooded. Now the labors of the devoted parents are doubled. When the old bird returns from the fishing it has eaten to repletion of the small fishes and crustaceans, which abound in polar waters, and from this predigested supply the young ones gorge themselves by thrusting their bills down the ample gullet of the parent.

Thus provided for, the young grow rapidly. When nearly full grown they leave the nests and gather in companies which are watched over by numbers of the old birds. Though they can no longer brood them, these nurses defend the young

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ADELIE PENGUINS AT NEST

Sometimes when forced to nest on a bank of snow, this penguin will carry its egg on its foot.

from the attacks of the skua gulls, and herd them away from the brink of precipices or other dangerous places. When about two months old and young moult from their downy stage and assume a coat of real feathers which fits them for their life at sea. They soon learn to fish for themselves and relieve their parents of the task of providing food and protection which has been their constant duty for

nearly four months. Thus the old birds are free to renew their own feathery covering, so necessary to fit them for the approaching winter. This process takes about twenty days, after which both old and young leave the vicinity of the nesting grounds, not to return until the breeding impulse takes them back again. By marking birds with colored bands it has been found that many of the birds return to the same rocks they had occupied the previous season. The young do not appear the following year, and it seems probable that they do not breed until nearly two years old.

Penguins use the flipper-like wings in swimming, moving them sometimes in unison, and sometimes alternately. They swim most rapidly beneath the surface and attain such speed that they are able to leap out of the water, the arc described covering several feet. This power is utilized by them when landing on the ice-floes. When the edge of the ice presents a steep wall, the birds are able to leap directly on the ice, and thus make landings that otherwise would be impossible. When in the air the wings are held straight out from the body, and probably are used in keeping their balance. The birds are so protected by their thick feathers and the fat covering their bodies that they can undergo a great deal of buffeting without injury.

Less insistent than the Adelie on a habitat characterized by continual snow and ice is the Royal Penguin (*Catarrhactes schlegeli*) which has been recorded from New Zealand, Campbell Island, and the Macquarie Islands. Its only known breeding place is the latter group, situated south of Tasmania, where the accompanying photographs were taken during the Australian Antarctic Expedition. The birds arrive on the islands in late September for

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ROYAL PENGUINS ON A ROCKY NEST

All the species of penguins have to take turns incubating and, later, covering the young, to protect their offspring from the rigorous climate and from the skua gulls.

their nesting, having been absent at sea since the preceding April. They begin at once to establish themselves, their only nest being a little circle of pebbles gathered from the immediate vicinity, with an occasional feather or bone, relics of their ancestors. Here the single whitish chalky egg is laid and incubation begins.

The immense colonies of Royal Penguins on the Macquaries have been for many years exploited by sealers for their oil. Here about one hundred and thirty thousand birds are killed annually. In the vicinity of the oil works it has been estimated that upwards of a half million birds are congregated, and the toll annually taken seems to make no impression. In addition untold thousands are found on other rookeries which are never disturbed, so that the species, under present conditions, is in no danger.

The rookeries are usually situated along the course of a glacier-fed stream, the valley of which forms a highway for the birds to and from the sea. In their nesting habits the Royal Penguins are essentially like their relatives the Adelies, and like them, they prefer elevated situations for nesting. The period of incu-

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ADELIE PENGUIN AND YOUNG

Even when the young are almost full grown the parents are looked to for protection and food.

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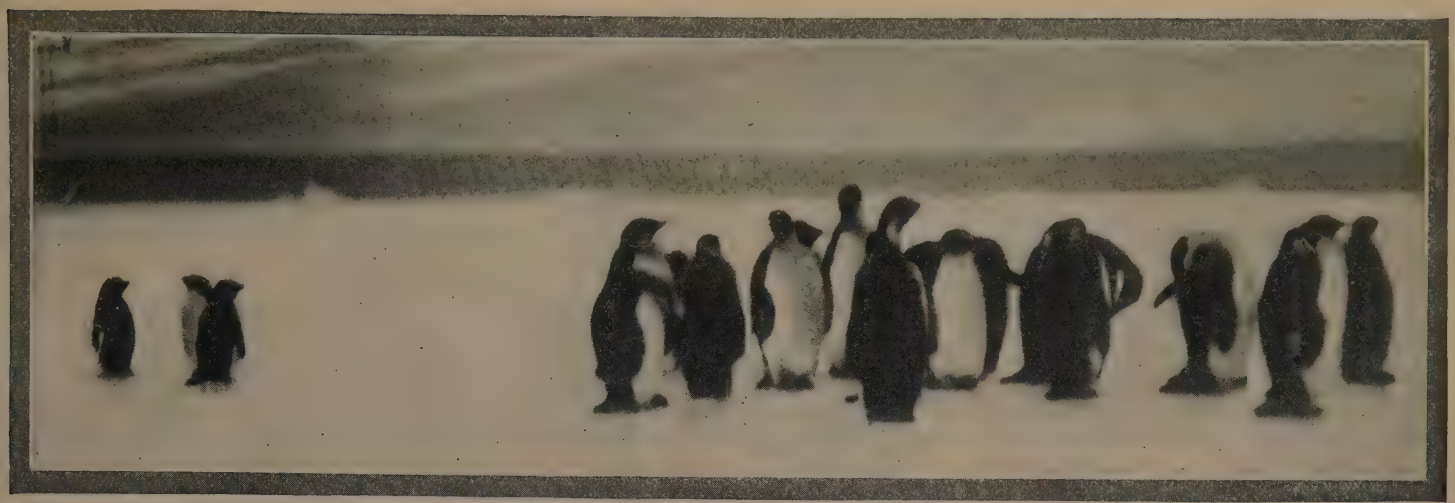
SNOWED UNDER BUT UNAFRAID

After being covered for many days beneath fresh snow they emerge with icy lumps frozen to their thick feathers.



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EMPEROR PENGUINS ENJOYING THE ICE

The bigger fellows on the right bear the royal name while those on the left are the Adelie.

bation is slightly more than a month. The setting birds are said to present a very grotesque appearance, since the plumes stand out on each side of the head, framing the red eyes and large pinkish bill. They resent any approach to their nests, not only by their cries, which are almost deafening, but by pecking and striking the intruder with beak and wings. The young have become grown and have completed their moult by the end of February, and then leave the islands. This leaves the way clear for the old birds to renew their worn plumage. Like all penguins this period must be passed on shore or on the ice, in fasting. For about three weeks, therefore, in February or March, not only the breeding birds but those raised the previous season, which return from sea for this purpose, must submit to this process, after which they are free to roam the seas for another five months.

The Gentoo or Johnny Penguin (*Pygoscelis papua*) is a species of the sub-Antarctic, reaching its southern limits on the Falklands, the South Orkneys, and Macquarie Island, where the photograph here shown was taken on the Antarctic Expedition under Sir Douglas Mawson. Their habits, which have been studied by a number of naturalists, resemble somewhat those of the Adelies which are of about the same size. Breeding in less bleak situations, however, they are better supplied with nesting material, and make comparatively elaborate nests of earth and grass. The eggs are usually two, and if robbed the birds will lay repeatedly. Like several of the other species they prefer highlands, and will climb a thousand feet or more to reach their favorite grounds, to which they return year after year. This habit is supposed to be a remnant of the time when the selection of lofty rookeries was necessary because the glaciers occupied all the lower ground, and the ridges lying between the deep ice-laden valleys afforded the earliest available bare ground. Once formed, this habit seems difficult to break in the case of the smaller species, and they cheerfully undergo the excessive labor of climbing the heights to their nests after each fishing excursion.

They are much more timid than the others, being easily frightened if not approached cautiously, and also being remarkable for their ability to get along together without quarreling. The young are clothed in gray and white down.

In a hollow on the crest of a high hill in the South Georgia Islands Murphy discovered a clear deep lake which is apparently visited for the last time by many Johnny Penguins when they feel death approaching. Perhaps, when ill, they dread to enter the sea for fear of their principal enemies, the sea leopards and killer whales. At any rate large numbers have died there, and their bodies, preserved in the icy water, now line the deep clear pool, safe from their foes.

The Emperor Penguin (*Aptenodytes forsteri*) the largest and handsomest of all this group, is also the most remarkable in many respects. The bluish back and black head is relieved by a patch of golden yellow on the side of the neck and a streak of rose color on the lower mandible. The lemon yellow breast, covered with ice crystals if the bird has just emerged from the water, shines like rich satin. With its imposing size and dignified bearing it is truly a noble bird.

Weighing as much as ninety pounds, never setting foot on the land, and breeding in the darkness and cold of the Antarctic winter, this bird may well challenge admiration. Though considered to be very low in the scale, the bird has developed an aptitude for living under such adverse conditions as can scarcely be equaled. Most of the details of the remarkable nesting habits of this bird were discovered

near Ross Island by the members of the English Antarctic Expedition under the command of Captain Scott, 1901–1904.

What it is that has engendered in the mind of the Emperor Penguin such distrust for the solid land we cannot guess, but whatever the reason it would seem that the bird is almost equally suspicious regarding the ice. This must be the reason that it selects the dead of winter, when the ice can be depended on, for its breeding, when a considerable period must be passed with a down-clad nestling which cannot come in contact with the water. So the bird, about the first of July, in the cold and darkness, lays its single egg and places it on the small platform formed by the two tarsi, where it is almost completely enveloped by the thick feathers of the abdomen, assisted by a transverse fold of skin which forms a sort of recess. Then the mother begins her long wait for the egg to hatch. Owing to the difficulties of observation the incubation period is not known, but it is probably about two months. During all this time the bird must visit open water to obtain its food, which consists principally of small crustaceans and fish. Like all penguins, the brooding Emperor must be relieved in its duty, but fortunately there is no dearth of willing foster mothers. Only a small proportion of the birds have eggs, but all the others, both male and female, are anxious to help incubate, and the egg is passed from one to another as occasion demands. After the young are out there is even greater eagerness to assist, and the poor chick, left on the ice by its protector, is at once seized and quarreled over, many being literally killed with kindness by their eager but rough relatives. As may be imagined from the adverse conditions surrounding the early life of the Emperor there is a considerable loss of life during the first few weeks, and much of this is due to the rough handling to which the young are subjected during these necessary transfers. Sometimes the poor chick will fall into an open ice-crack and perish from cold, while two old birds are trying to decide which shall mother it. Since not more than one old bird in ten lays an egg, and the early mortality is very great, one wonders why the race of Emperors persists. This must be owing to the long life attained by those individuals which are so fortunate as to survive their infancy.

As is the case with most penguins the young Emperors are fed on the partially digested and regurgitated food, mostly fishes and small crustaceans, brought them by their parents and nurses.

The young one is covered at first with a white down, with black on the top and back of the head. In this coat it remains for about four months. It then discards the down and assumes a plumage which differs entirely in color from that of the adults, but consists of regular feathers which allow it to enter the water. A year later it again moults, to another immature stage, and it is about two and a half years old when the fully adult coat is first acquired. Whether the bird learns to take care of itself when it first assumes its water suit is not known.

Allied to the Emperor and scarcely inferior in size is the King Penguin (*Aptenodytes patagonica*). While the Emperor is truly a bird of the Polar wastes, scarcely venturing north of the Antarctic Circle, the King occupies a less frigid zone, never having been noted south of that line. It also lays only one egg which it carries about while incubating in the same manner as the Emperor, but in accordance with its different habitat it conducts this process on the land. Since no nest is built, the egg is thus protected from the wet and muddy ground which is the bird's chosen nesting place.

The King Penguin, however, not having to depend on solid ice, is not obliged to nest in winter. It lays, therefore, in November in the beginning of the short Antarctic summer, the season preferred by most birds the world over.

When the young bird hatches, after about two months incubation, it is covered all over with dark brown down. This, apparently, is retained for about ten months, necessitating a long period of care by the old birds, since no penguin can enter the water in the downy plumage. Since the Emperor and the King are closely related, naturalists are unable to account fully for the extraordinary differences in their time of nesting, and particularly the differences in the plumages of the immature birds, and in their development.

BEGINNING with the March issue of NATURE MAGAZINE, Professor E. Lawrence Palmer of Cornell University, author of the Cornell Rural School Leaflets, will contribute each month a unique and interesting new feature to the Nature Study Department. It will make you think and puzzle.

Explorations in Cloudland

By CHARLES FITZHUGH TALMAN
U. S. Weather Bureau

IN THE whole realm of literature it would be hard to find a more remarkable mingling of knowledge and ignorance, sound sense and childish nonsense, beautiful thoughts and nightmare figments, than the writings of John Ruskin on the subject of clouds. This subject bulks large in his "Modern Painters." Ruskin deserves immense credit for having inculcated accuracy in the delineation of the sky on canvas. His explanations of the effects of perspective upon the apparent shapes of clouds are well worth the attention of every meteorologist. He finds for us new beauties in the daily pageant overhead, and peoples the picture with the graceful beings of classic myth. When, however, he embarks upon his rambling speculations concerning the physical characteristics of the clouds—their origin, composition, optical effects and the like—he is the unscientific and antiscientific literary man at his worst, and he must have been a painful thorn in the flesh of such contemporaries as Tyndall and Sir John Herschel. The pinnacle of absurdity is reached in one of his less widely known books, entitled "The Storm Cloud of the Nineteenth Century," in which he gravely asserts that in the years between 1871 and 1884 a portentous "plague-cloud" prevailed in the skies of Europe, accompanied by a no less weird and malignant "plague-wind," both unlike anything previously observed in the world. Shorn of its classical allusions and otherwise modernized, this crazy production might find a congenial place in the yellowest Sunday supplement of the present day.

PHOTO U. S. AIR SERVICE

COMMON CLOUD OF WINTER SKIES

The strato-cumulus is also seen at other seasons of the year.

Meteorology has not generally been so serious a stumbling-block in the path of imaginative writers as astronomy. Few glaring blunders have been made by poets and novelists in connection with clouds compared with the number of those relating to the moon and the stars. Shelley's poem, "The Cloud," was written before science had proved that dew is not shaken from the clouds but is condensed directly from the air upon terrestrial objects. This poet administers his worst shock to scientific susceptibilities when he describes the rainbow as "million-colored"—an abuse of poetic license that perhaps stands without a peer.

The painters, on the other hand, have taken even greater liberties with the clouds than with the celestial luminaries. Many of the Old Masters seem to have regarded their skies as mere conventional backgrounds, in which fidelity to Nature was of no consequence. This tradition is still in force. An English physicist, Dr. W. J. S. Lockyer, used to visit the annual exhibitions of the Royal Academy and subsequently describe in a scientific journal the curious skyscapes that he encountered there. Some of his discoveries were appalling.

Science, however, has reason to be modest about its own adventures in cloudland. Cloud study has always been a somewhat backward branch of meteorology and is in no very satisfactory state at the present moment. Down to the beginning of the nineteenth century scientific men had not even devised names for the various typical forms of

cloud, and therefore it was impossible to maintain an accurate record of the clouds seen at any place from day to day.

The epoch-making cloud classification of Luke Howard appeared in the year 1803. This system was based upon three fundamental forms, viz., fibrous or feathery clouds (*cirrus*), clouds with rounded tops (*cumulus*), and clouds arranged in horizontal sheets or layers (*stratus*). Three intermediate or derived forms were recognized, viz., *cirro-stratus, cirro-cumulus* and *cumulo-stratus*. The rain cloud was named *nimbus*. Howard's classification was received with enthusiasm throughout the learned world, and the Latin form of the names helped to give it currency. One of the wise men of the day who recognized its ingenuity and scientific value was Goethe. He made the system generally known in Germany, not only by translating Howard's definitions into German but also by writing a poem in honor of their author and a separate little poem about each of the principal types of cloud! Goethe himself proposed the name *paries* (wall) for a low bank of cloud along the horizon, but this term has not survived.

If Howard's Latin names for the clouds had been as long and as difficult to pronounce as the scientific names of certain plants and animals, to say nothing of the prodigious terms used in organic chemistry, there might have been some justification for inventing "popular" equivalents suitable for everyday use. Such equivalents were quite unnecessary, but were nevertheless introduced in the year 1816 by Thomas Forster. He called cirrus *curlcloud,* cirro-cumulus *sondercloud,* cirro-stratus *wanecloud,* cumulus *stackencloud,* stratus *fallcloud,* cumulo-stratus *twaincloud,* and nimbus *raincloud.* The last of these was, of course, no novelty. The others, manufactured by Forster, have led a struggling existence down to the present day. One of the works that welcomed them was the Encyclopaedia Britannica, which, for the sake of consistency, ought to have Englished its own name to "British Encyclopaedia." You may still find these superfluous terms in the dictionary, but hardly anywhere else in contemporary literature.

PHOTO H. H. HILDEBRAND SON

CORONA AROUND THE MOON

A colored ring formed by water clouds or sometimes by dust.

The system of cloud nomenclature now in general scientific use is known as the International Cloud Classification, and dates from the year 1894. It is a modification and enlargement of Howard's system. The cloud names and their definitions, according to this classification, are given in all current treatises on meteorology as well as in a great many reference books. The Weather Bureau publishes a pamphlet containing both the classification and pictures of the various types of cloud, and a number of similar pamphlets have been issued abroad. The standard of authority on the subject is the International Cloud

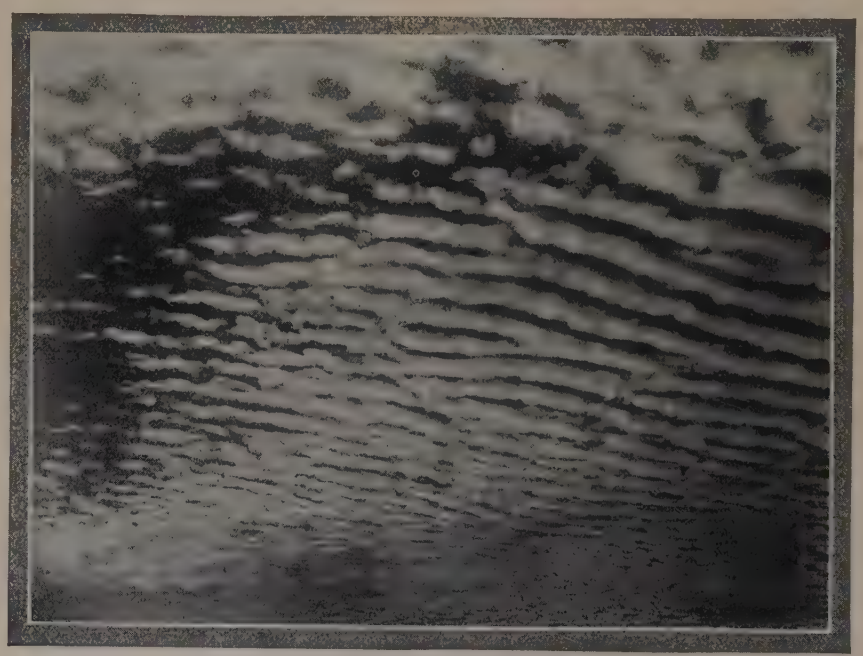


PHOTO A. J. HENRY

ALTO-CUMULUS CLOUDS

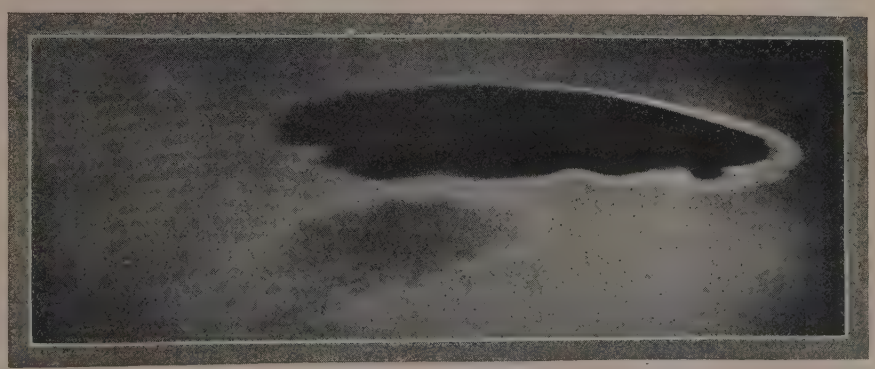
They are formed by billows between two strata of air having different movements.

THUNDERSTORM IN THE MAKING PHOTO F. ELLERMAN

A cumulus cloud becoming a cumulo-nimbus or thunderstorm cloud, presaging fireworks in the skies.

Atlas, the second and latest edition of which was published in three languages in 1910.

Unfortunately, hardly any of the books that set forth this learned catalog of the clouds tell you the whole truth about it. Far from being a finished product, reasonably free from ambiguity and otherwise well adapted to its purpose, the International Cloud Classification is only a makeshift, and much of it is vague and unsatisfactory. Its principal advantage over Howard's classification is that it recognizes the more or less definite relation existing between the forms of clouds and their altitudes. On the other hand, there are a number of inconsistencies in its definitions, and even between the versions of a single definition in different languages. Hardly a year passes that some meteorologist does not suggest alterations in this classification or an entirely new system to replace it. The root of the matter is that nobody has yet discovered *any* wholly satisfactory method of classify-



A LENTICULAR CLOUD BANK PHOTO C. F. BROOKS

Such clouds are generally stationary and sometimes show iridescent colors.

ing the clouds. The problem is not like that of classifying such things as butterflies and daisies. Clouds change their forms, often with great rapidity, and exhibit so many varieties that if you once begin to make a detailed classification there is no end to the process. Many elaborate classifications have, however, been published and more or less widely used, so that, in the aggregate, hundreds of cloud names figure in the literature of meteorology.

The International Classification arranges the clouds in five principal groups. First come the lofty ice clouds — cirrus and cirro-stratus —which are known as Upper Clouds, and are at an average height of something like 30,000 feet or 6 miles above sea-level. As in the case of most other clouds, their height is somewhat greater in summer than in winter and in equatorial than in polar latitudes. Cirrus occurs in detached threads or fibres ("mares'-tails" are but one of its many forms); cirro-stratus in broad sheets, sometimes fibrous and sometimes filmy or hazy. Cirro-stratus reveals its icy nature by producing halos around the sun and moon.

PHOTO A. M. COMEY

A SOLAR HALO

This ring is formed by cirro-stratus clouds.

The "cirrus level" is generally regarded as the top of the cloud world, but from time to time there have been reports of mysterious "noctilucent" or night-shining clouds, supposed to be 50 miles or more above the earth and to consist of volcanic or cosmical dust. A great deal was heard about these clouds after the eruption of Krakatoa in 1883, and they are said to have been observed both before and since that period, but their existence remains somewhat problematical.

Reverting to the clouds of ordinary occurrence, we have next below the cirrus level the Intermediate Clouds, occupying roughly the space between the altitudes of 10,000 and 23,000 feet. There are three types: Cirro-cumulus, occurring in small rounded flakes; alto-cumulus, consisting of larger rounded masses; and alto-stratus, which forms a sheet denser and darker than cirro-stratus. These are water clouds, as are the clouds of still lower levels. Cirro-cumulus and the smaller forms of alto-cumulus are popularly described as "mackerel sky." Both these types often have a beautifully waved structure, due to the flowing of air currents of different velocities and directions over each other, each cloudlet marking the crest of an atmospheric billow or ripple.

PHOTO WM. S DAVIS

POLAR BANDS

Cirrus, cirro-stratus and cirro-cumulus clouds often form stripes, apparently converging but really parallel.

Next come the Lower Clouds—strato-cumulus and nimbus—lying below a height of about 7,000 feet. Strato-cumulus consists of lumpy rolls or masses, spread in a more or less continuous layer over the sky. It is the common cloud of winter. Nimbus is described as "a dense layer of dark, shapeless cloud with ragged edges, from which steady rain or snow usually falls." This description leaves much to be desired,

PHOTO F. ELLERMAN

CIRRUS—A CLOUD OF MANY FORMS

It takes varied shapes as filaments on a blue sky, threads forming into feathers, isolated tufts and other forms.

because rain and snow fall from clouds of various forms and various levels. Hence nimbus is something of a conundrum, and many meteorologists wish that Howard had not set the example of including it in cloud classifications.

The fourth group of cloud types includes the rounded masses of cloud, often of mountainous size, that are formed in the daytime by the ascent of moist air. There are two types—cumulus and cumulo-nimbus—both with bases a mile or so above the earth. Cumulus is seldom more than 1,500 feet thick, but cumulo-nimbus, the thunderstorm cloud, sometimes towers 4 miles or more from base to summit, and may spread over many square miles of country. A full-grown thundercloud is generally crowned by an anvil-shaped mass of fibrous ice cloud, known as "false cirrus."

Lastly, in a class by itself, we have the lowest of the clouds—stratus—which is merely a sheet of lifted fog, devoid of shape and pattern.

The International Classification recognizes a few special forms of cloud besides these main types. They include the "fracto" or shredded forms of cumulus, nimbus and stratus; the sinister-looking mammato-cumulus, with bulging sack-like protuberances on its lower surface; and the ovoid banks of lenticular cloud, which, instead of moving with the wind, stand still while the air flows through them, the cloud forming on the windward side and dissolving on the leeward. The classification makes no mention of the various cap-clouds, crest-clouds and banner-clouds, formed in streams of moist air flowing over mountains. Writers of a century ago called them "parasitic clouds," and devoted much curious speculation to them, as did Ruskin at a later period. Neither is any notice taken of the very

(CONTINUED ON PAGE 133)

"HERE IS THE PLACE," SAID SWIFT

By BEN HUR LAMPMAN

(This is the conclusion of the fascinating story of the stirring episodes in the life of Swift, the Steelhead Trout.)

OF SWIFT as a sea-trout there is little enough to tell. An immensity of depth and distance screened him from the study of those who seek. His times of rest and restlessness were ordered by the tides. An alchemy of brine silvered him from nose to tail, obliterating the last spot, the least trace of darker coloration. He grew apace in length and girth, till the flat body of youth was rounded and plump and the fine head exquisitely modeled by maturity. Lacking an aspect of ferocity, so common to those who prey, he was for all that an efficient killer, stalking and striking the lesser fish of his wide range and finding ever a renewed and mounting courage.

Thrice the cycle of seasons ran its course. The sea was bright with spring, temperate with the blandness of summer, shrouded in the fogs of fall and bitter cold with winter. When the rains came and a faint but potent flavor of river silt penetrated the depths, the huge schools of trout and salmon swam toward the crash of the breakers and sought again the amber course to the hills.

To Swift the memory of the gray rock was vague and wonderful, but though he kept pace with the others for a time, always he sheered again to the feeding grounds and puzzled his wits that they should quit so fine a province for the lean and paltry streams beyond the beach. In girth and glory now he was the equal of many a stout male chinook, those kings of the salmon clan, yet from them and their stolid strength he differed both by grace and keen sagacity. They cast themselves awkwardly from the ocean, in joy of pilgrimage. Swift rose as a blade unsheathed. He ranged beside a giant salmon, whose course held steadily landward.

"Prince and cousin," said Swift, "why do you answer the river, when the sea is always good?"

"As to that," replied the chinook, never pausing, "it is enough that it rains." He rose and leaped, where the cliffs loomed from the stormy mist and splashed heavily as he fell. "It rains," he repeated.

"It has rained before," persisted Swift, rolling to glimpse the fretted surface of the sea.

"An empty shell and the wit of a trout are one," said the salmon gruffly. "It has not rained for you."

Full thirty inches in length, with a trace of paunch, was Swift when his rain came. The sea-sparkle waned to a leaden hue and heave. The sea itself was tense with waiting. Then toward the dunes and twisted cedars of the beaches sped a flurry that raced to lose itself upon the sands. With dark and magic fingers the storm beat upon the ocean and woke the waves to charge. Before the strong tincture of soil emerged from the swollen river Swift knew the rain for his own—as he had known in the eddy the day of his adventure. A whisper reached him far at sea and filled his being with unrest and longing. For he had heard dimly, but with insistence, the first gust of rain brush the gray rock and the riffle. He flung himself clear of the hurrying waves, where the gulls flew low between. Clouds to landward and at sea, a white wreath blown from the bird rocks—and, out where all sails dwindle, an advancing crest of spume.

He heard it then beyond mistaking, rain on the distant hill stream, and, quite forgetting the sea, he turned toward the big river—driven by more than fins, mastered and impelled by a new desire to taste fresh water and find the very pebbles that sheltered him at birth. No longer was he puzzled or in doubt. With ten thousand of his kind he hastened joyously. The vigor of his leap wrought the emerald sea to jade about him, the savor of the stream was in his gullet, its murk enfolded him, and Swift was very happy.

Far inland, searching the shoreline for the savor of his own stream and urged by dreams that tingled to his film of silver scales, he came to an odd barrier, almost threadlike in its seeming fragility but stouter than kelp. To and fro he searched it cautiously, seeking a passage but finding none. He thrust at it curiously to discover that it yielded to the pressure. And because he was in some haste and also for that he believed in himself, he lunged at the barrier petulantly, thinking to force his way. Cruel and insistent was the instant grip of the mesh, nor could his maddened efforts achieve anything save redoubled pain. And so death was very near to him when the sturgeon came.

"HE SAW THE STURGEON BLUNDERING ONWARD, DRAPED WITH TWINE"

In sea or river it is well known that the sturgeon is no better than a ponderous oaf, with the stubborn strength of the witless—an eater of garbage and a target for jest. Lacking wit, this one wasted no moments in cruising the net. He, too, had heard a whisper meant for him alone, and when his long snout tangled in the stout twine he was more vexed than alarmed. Great tail, great fins, huge plated body, surged with Titan strength against the barrier, until net and fish were a tossing tangle. By dozens his dullard strugglings snapped the meshes, and in a welter of roiled water Swift, faint with his own frenzy, felt a strand yield and knew that he was free. He saw the sturgeon blundering onward, draped with twine, and with what strength remained to him he swam weakly into the deeper stream. When next he encountered such a barrier, Swift rose warily upward and, with sky above him, leaped free.

Unscathed, he came to his own river and passed upward. From a hundred streams he knew it for the one of his birth—an old familiar lane. Salmon were splashing and delving in the gravel, recklessly bruising themselves upon the rocks they thrust aside. Within the river arose an incessant chime and rumble of the stones they displaced. Some had taken their bridal stations, solemn with the romance of their return, and about these clustered the eager river trout, the swaggering cutthroat, and now and again such a fish as Swift himself. The raiders gathered in a half circle beyond the bridal pair, and as the sleek she salmon freed her eggs, with a fluttering of body from head to tail and a flash of flank, the more venturesome darted forward to seize the delectable food. Observing this and visibly moved by the scent of such provender, Swift took his place among the bandits and, pausing but briefly, rushed in.

When the salmon folk ascend the natal river, bright as an armored knight, Providence works a strange alteration upon them, having utility more in mind than comeliness. Though these were such fish as Swift had known in the sea, they no longer were placable, either in temper or appearance. The rounded head of the male had grown fierce canine teeth, and a most terrible snout wherewith to defend his lady and himself from the importunities of scapegrace cousins, bent upon destroying the priceless spawn of his mate. Stolidity had been replaced by rage, as beauty by ugliness, as the sea-silver had yielded to drabness. This was the bridegroom whose most inviolate nursery Swift had dared invade.

Had you been there at the river that sun-washed afternoon, when at one hour only the light fell so graciously that river-bed and river-things were seen as through glass, you might have witnessed the dis-

comfiture that Swift invited and received and that for fully half a day he did not quite forget. For Swift was fat and rotund with good living, and the male salmon was lean and active from the fast of his bridal tryst, as well as most reasonably irritated.

The pleasant flavor of his spoils was sweet in the gullet of Swift when the salmon whirled and charged. Before those terrible teeth, that berserk rage, he fled without dignity, and there are trout yet living who might relate how the furious male drove him into shoal water and left him flopping almost on the sands. To flop back one's rightful depth is never dignified nor conducive to prestige, but in that manner Swift returned to the channel and, with what impressiveness he could muster, swam questing up the stream.

"A SWIMMER IN FUR, AN ODD LITTLE FELLOW"

His river, born of the hills and happy with the tribute of many creeks, now broad and shallow and chuckling, now deep and grave and racing, now white and wild and shouting. Never since water ran to the sea had such another river been fashioned for the affairs of trout. Reflecting pleasantly upon these self-evident truths, Swift beheld the paddling strokes of a surface-swimmer, beating rapidly at the dark line of the eddy—a swimmer in fur, an odd little fellow, oddly remindful of something quite forgotten. The great sea-trout turned lazily, rose with an air of deliberate inquiry, and closed his jaws upon the living lure.

The effort to recall just what this squirming morsel was surpassed him. He swallowed and forgot. And so it was that the water-shrew, long ripened in wickedness, came to a most uncomfortable end. . . . His river. . . . At that moment she entered the eddy.

Not until that vivid instant had Swift known why or what he sought. A rain had called him up from the rich sea, but not even the rain seemed to understand the meaning of its call. As the complacent old chinook had said, the rain was the rain, and everyone who really mattered answered the rain, soon or late. Nor had Swift met any of his own kind who knew. It was the rain, they said. One must go always upstream. Nor, until now, had he seen one of his own kind who interested him other than as a very probable competitor in the rush for a drowning fly or the pursuit of minnows.

Unanticipated emotion claimed him as she slipped gracefully in from the current—beautiful in silver-leaf, with wise, bright maidenly eyes set in the finely modeled head, a flush upon the gill-cheeks, a hint of delicate rose along the plump flanks. With a gallantry hitherto foreign to him, Swift forbore to strike the white miller that danced above them. What charm! What grace! The girl knew how a fly should be taken!

"This way, my dear," said Swift.

If you think this an easy conquest for our hero you must pause to remember that he was the Launcelot of his people and that none surpassed him. As for his betrothed, suffice it to say that they were well mated, and that this understanding was both mutual and agreeable as they left the eddy for the river paths and resumed the search. Sad willows trailed their tips in the hastening water, tall firs marched down to the brink stark cliffs, raised palisades above the stream—by riffle and eddy and rock, by chuckle and shouting and silence, they swam the flood of a hundred hills.

On a day, a month from ocean, Swift saw midway of the river the bulky base of a granite monolith, gray and ancient, save where its flanks were daubed with mosses. Shoreward the stream lifted into laughing shadows. Between, as deep as his body's length, were mottled gravel and smooth current. He leaped gloriously and took the water as a blade is sheathed.

"Here is the place," said Swift.

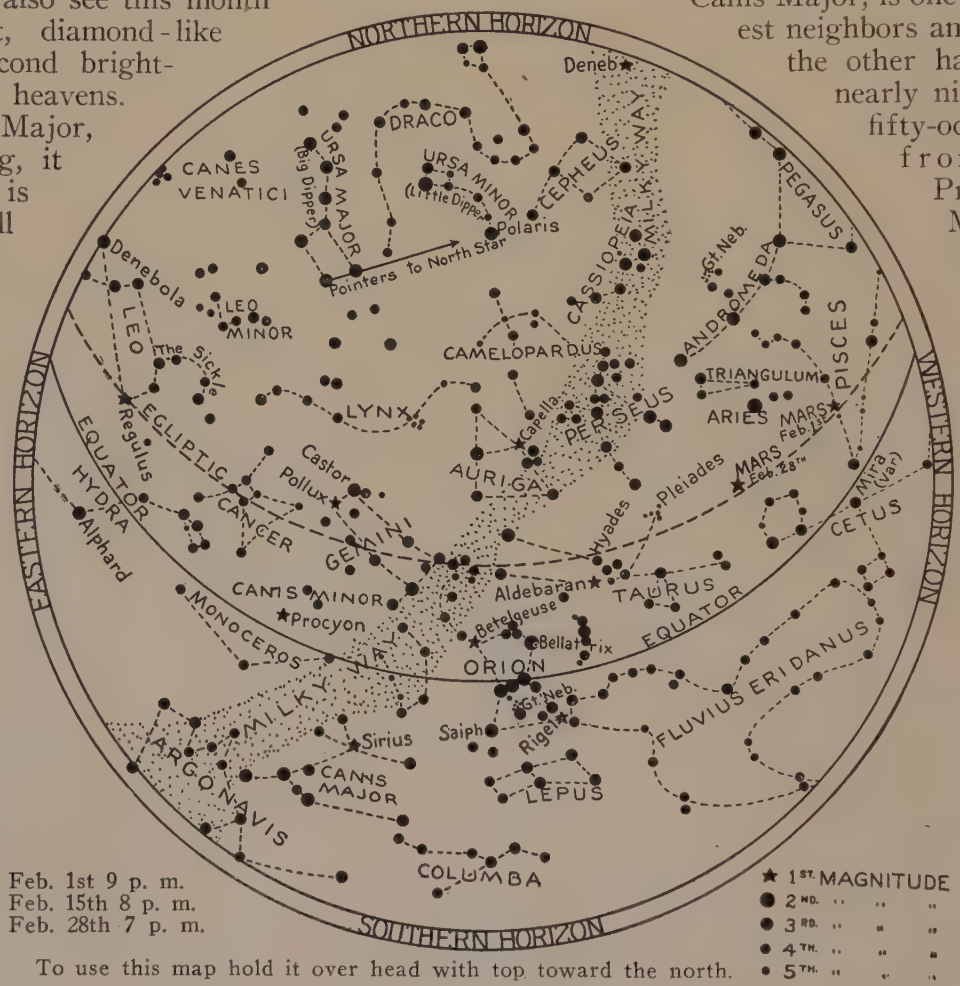
"LEFT HIM FLOPPING ALMOST ON THE SANDS"

The Evening Skies in February

By ISABEL M. LEWIS

THE EVENING skies of February are, if anything, more brilliant than those of January. Nine stars of the first magnitude are above the horizon at the time for which the chart is given, in addition to the planet Mars, now over in the southwestern part of the sky.

If you live south of the thirty-fifth parallel of latitude you will also see this month the magnificent, diamond-like Canopus, the second brightest star in the heavens. Sirius in Canis Major, The Greater Dog, it will be recalled, is the brightest of all the stars and it will now be found in the southeast. Canopus lies far to the south and a little to the west of Sirius, and in our southern states it will appear above the southern horizon for a very brief period at this time of year. In northern Africa, Canopus shines high over jungle and desert, its clear, blue, diamond-like rays making it a glorious beacon to guide many a wanderer on his way through the trackless wilds and desert. It has often been called the Star of Egypt and the Desert Star, and it is said to have been an object of worship among many wild tribes of Africa.



To use this map hold it over head with top toward the north.

Orion is now nearly due south and is particularly well placed for observation. Anyone glancing toward the south in the most casual way with no thought of star-gazing could not fail to be attracted by and admire the brilliant stars that outline this glorious group of stars that is said to be at the almost unimaginable distance of 650 light years or nearly four thousand trillion miles from the earth, that is, four thousand *million* million miles. The red star Betelgeuse, which is not a true member of the Orion group of stars, is much nearer to the earth, its distance being generally estimated to be about 160 light years from the earth. Sirius, in Canis Major, is one of our very nearest neighbors among the stars, on the other hand, though it is nearly nine light years or fifty-odd trillion miles from the earth. Procyon in Canis Minor, The Lesser Dog, is also a near neighbor of ours among the stars. It is about ten light years away, or a few trillion miles more distant than Sirius.

Canis Major and Canis Minor are the two dogs that follow closely on the heels of Orion as he strides majestically across the heavens. Sirius, in fact, is often called The Dog-Star, and the dog days of summer received their name from the fact that in ancient times Sirius rose in the sultry days of summer at the same time with the sun. The rising of any star with the sun, called its helical rising, always seemed to have a very special significance to the ancients, and any peculiarity of the season was attributed to the influence of that star over the affairs of men or the weather. All of this, we now know, was nothing but superstition, although astrology, which tries to associate the affairs of men with the stars and planets, once had a great hold over the minds of men. As

the human race grows older and wiser it sees the absurdity of thinking that the stars and planets control our lives or in any way influence our affairs, and astrology today is no longer taken seriously except by the ignorant or superstitious or those who wish to impose upon the credulous.

This month we find that the Big Dipper is again coming into view in the northeast after being too low in the northern heavens to be seen to any advantage for several months. From now into the spring and early summer it will swing higher and higher in the heavens above the north pole as Cassiopeia, now in the northwest, across the pole from the Big Dipper, sinks continually downward in the evening sky in the direction of the northern horizon. Of course practically everyone is familiar with the method of locating the North Star, Polaris, by the aid of the Pointers of the Big Dipper as indicated on the chart.

It will be noticed that there are a number of fairly bright stars below and to the southwest of the Big Dipper. These stars also belong to the constellation of Ursa Major, the Greater Bear, of which the bowl of the Big Dipper represents the body and the handle the creature's ridiculously long tail which is certainly quite out of place in a bear, if the ancient bear was anything like the bear of today. Ursa Minor, The Little Bear, we also see has a similar peculiar and unbear-like appendage.

If you have been keeping track of the constellations that appear in the evening skies during the summer and fall, you will notice that some of our old friends among the stars that were high in the heavens a few months ago are now disappearing from view in the west while other new groups are appearing in the east.

All that now remains visible of the Northern Cross that rode high overhead in the path of the Milky Way not long ago is its most brilliant star, Deneb, which is about to disappear below the northwestern horizon. The Great Square in Pegasus, which appears in the east early in the fall, is also passing from view in the northwest. The part of the Milky Way that now crosses our evening sky from the northern horizon nearly through the zenith to the southeastern horizon, though marked by a brilliant trail of light on clear dark nights, is very different from the portion of this girdle of the heavens with which we became so familiar in the late summer and early fall.

High in the east now appear the leaders of the constellations that we associate with the spring months, Cancer, and Leo with its characteristic Sickle, and Hydra, The Water-Snake, his head marked by a group of third and fourth magnitude stars a little to the south of the inconspicuous Cancer, who will drag more and more of his huge, sinuous form above the eastern horizon as the weeks pass by.

Orion and his Dogs and Gemini, marked by the twin stars, Castor and Pollux, will not pass from view below the western horizon for many weeks, however, and before they leave our evening skies to return no more until late next fall we should become well acquainted with their distinctive forms that we may readily recognize them and hail them as old friends when they return once more unchanged and familiar.

The Forest Primeval

(CONTINUED FROM PAGE 84)

its path until a score of trunks and tops lay twisted in a hopeless labyrinth. The naturalist seemed lost amid a thicket shoulder high of ubiquitous salal, that giant relative of our innocent wintergreen. Its pinkish blossoms, so soon to turn to dark purple berries, held no charm for him, as the stiff branches gave just far enough to entrap his forward foot and then sprung back to trip him again and again. If only he might get a hand hold on some shrub to pull himself out to easier going on that log. Just over it the sun glimmered upon low greenish-brown branches and large, succulent, five-pointed leaves almost like a shrubby Big Leaf maple. The naturalist put out his hand, quickly drew it back, and then scrambled to safety without taking hold. He knew that pretty shrub to be the Devil's Club, beneath whose pretty innocent-looking leaves and along whose stalks lie rows of small, very sharp thorns which, breaking off in the flesh, are quick to fester into painful sores.

Stopping now and again to consult his pocket compass, the editor had wandered on ahead. It seemed surely that he had just descended that very rocky slide! Was not the magnetic needle wrong? No, it was only one of the illusions of the primeval forest. He shouted with all the power of his lungs. No answer came, and yet, a moment later, the other two appeared. Sounds in that deep-carpeted temple often seem to wander off to mingle with the whispering wind, and die. Again, in some rocky gorge a shout echoes and reechoes until the bewildered listener recognizes no direction or chooses wrongly.

At last the slope tilted sharply downward and light showed through the trees. Slipping and sliding, the three explorers came until at last the forest broke before a mirrored lake. Peaceful and unscarred by any human hands it lay, while only the loons that laughed and played in the sunlight broke the utter stillness of the scene. We stood, all three, in the heart of the primeval.

Date Gardens of America

By GUY E. MITCHELL

AS THE coconut is synonymous with the staff of life to the inhabitants of most tropical islands and seacoast countries, so in even a greater degree is the date palm to dwellers in the great hot desert regions of the world—a prime source of both food and shelter. In America we have never considered the date other than as a confection—a luxury—and it may perhaps always continue as such, even though it has an important food value. The readiness with which everybody takes to dates and the universal demand for them led the Department of Agriculture some years ago to investigate the possibility of date culture in some of our own desert regions in the west, and the results have borne fruit—in the shape of dates as fine and luscious as the very best dates that ever came out of Arabia or Egypt.

Foreign dates brought into the United States have in only one year exceeded fifty million pounds, and the average importations have been much less—at best only a few ounces a head for our population. This is an absurdly low rate of consumption for a most toothsome fruit which combines a large food value and which can be produced so cheaply. The date, too, is an exceptionally wholesome "sweet" and, as Wilson Popenoe, agricultural explorer of the Department of Agriculture, well says, there would seem to be no reason why this good fruit should not become a regular part of the diet of American families, being eaten not wholly as a luxury or dessert, but as a source of nourishment.

MALE DATE TREE IN FLOWER

To produce fruit the flowers must be pollinated by tying some male blossoms to each cluster.

At any store we can buy what are considered good dates put up in nice little packages for about 25 cents a pound, but because you have eaten and enjoyed these do not imagine that you know what really fine dates taste like. The California and Arizona dates retail at from 75 cents to $1.25 a pound, and are in strong demand at these enormous prices. This is a fine thing for the man who is so fortunate as to have a date

garden with trees bearing from 150 to 250 pounds each, but it seems a discouraging outlook for the most of us who are anxious to eat some of these American-grown dates. Yet everything must have a beginning, and the American date industry is just getting well started. For awhile, because of their supreme excellence, they will be a real luxury and will command high prices, but on account of these same high prices the date acreage will be rapidly doubled and quadrupled until before long the cost of American dates will come down within reach. At the same time, date gardens will probably for a long time be a highly paying crop.

The late Secretary James Wilson of the Department of Agriculture was an enthusiast over the fostering of a big date-growing industry in the United States; but the idea of growing American dates goes back to before agriculture was made a cabinet portfolio. It was about the year 1888 that "Uncle" Jerry Rusk, then Commissioner of the Bureau of Agriculture, sent one of his "young men" into Africa to secure fruiting date trees for introduction into the United States. Seven comparatively large date palms of bearing age, and the fruit of which had been eaten by the agricultural explorer, reached Washington, D. C., in prime condition. After resting to recover from their ocean journey, they were tagged with government-free postage franks and carted over to the Washington city post office. Each palm was growing in a half hogshead, requiring four husky negroes to lift it. A post office clerk came out on the platform to see what it was all about and, when he caught sight of the tags, exclaimed:

"We won't handle those tubs; you can't send those by mail;" to which the darky foreman rejoined: "Ah reckon you'll have to, boss. Mr. Van Dieman done tole us to bring dese yere pahms over heah for youall to send away by mail. Dey's got de frank tags on dem same as a package of free seeds."

"But I tell you," expostulated the bewildered postal clerk who saw something over a ton of free postage before him, "that we can't handle them. Why, it's out of the question; they'll take up half an express car."

"Ah doan know nuffin 'bout dat," said the grinning negro. "We's done our part of de job.

DATE BUNCHES PROTECTED

Cheesecloth covering placed around the fruit to keep out bees and wasps.

FOURTEEN-YEAR-OLD DATE ROW

The trees in this garden are full-bearing at this age.

Come along, boys, we's going back to our wo'k."

Since the big palms were properly tagged as first-class mail matter, "official business," the Post Office Department could do nothing else than mail them to Arizona and southern California as addressed.

Following this humorous incident has grown one of the most intensely fascinating industries in the United States, already well established, and promising to soon become one of much importance. For a long time I lost trace of these first seven date palms and had almost forgotten the incident when recently I surely found one of them in far southern California. It is widelyknown there as the original date tree and has been named the Wandering Jew. And, too, Californians will tell you that this palm was a proven tree and bore fruit in Egypt before being imported and shipped to Fresno, Calif., where it was planted and grew for several years but refused to bear dates. Later it was removed to Pomona, much farther south, where it again took root and grew to a height of about fifteen feet but still failed to bear fruit. Once again, and by this time a very large tree, it was taken up and shipped into the Coachella Valley—a desert of deserts—where, the second year after planting, it produced fine fruit.

LADEN BRANCHES OF THRIFTY YOUNG TREE

To prosper, according to the Arab saying, the date tree must "have its head in the fire and its feet in the water."

This desert valley, the Coachella, is synonymous with date gardens, for while there are other American areas where the date thrives, it is claimed for the Coachella that the combination of great summer heat and desert aridity makes it even more ideal for date growing than many of the famous desert date regions of the Old World.

A trip into dateland makes us forget some of the commonplaces of the ordinary American life of hustle and bustle. Before the first day has passed we catch ourselves wondering if we have not gotten clear away from the United States into some corner of the Biblical Old World. These date palms which have invaded America have brought with them no little of the romance and mystery of the ancient lands.

There are many date gardens in Arizona, in the great Imperial Valley of California, and in other places besides the Coachella Valley of southern California, but the present little glimpse of dates will include only a short trip into the latter. This arid valley is a long stretch of indeed the most forbidding looking of deserts. Starting from Los Angeles in an automobile in the middle of August, we ran south some sixty miles, crossed diagonally a low mountain range of about 2,500 feet elevation and then, as we got over to the Coachella side, dropped down, down, down, as the automobile sped swiftly along over a good roadbed, the temperature quickly

getting hotter and hotter and hotter until at Indio, the center of dateland, we were eleven feet below sea level and the thermometer stood at 128 degrees. We were in a desert where the rainfall for the previous year had been a fraction less than one inch; where the air was so dry that even this presumably intolerable heat was actually not uncomfortable, and where the perspiration which you would expect to pour from your skin never appeared at all. There is no oppressiveness in such atmosphere. The air is tremendously hot, but you draw in full breaths and feel almost invigorated.

This is the climate for the date, which, as the old Arab proverb says, must "have its head in the fire and its feet in the water." And there is abundant water here for the date palm. For a million years, perhaps, this trackless desert supported only the most ultra desert plants. Sometimes the valley goes for sixteen or eighteen months without any rain. Some years ago a test well was put down at Indio, a one-shed station on the Southern Pacific Railroad, and as a result there are now about 6,000 acres under irrigation—dates and long-staple cotton—while an apparently inexhaustible flow of artesian water can be obtained from 400 to 600 feet depth, the water rising in the pipes to within a few feet of the surface, whence it is pumped out. The date trees are a thirsty lot; they must be irrigated between May and November every twelve days—not just a hard watering but a soaking. We reached the land of dates just after dark and proceeded to camp out at an old, practically abandoned desert ranch. The temperature had gone down, apparently, to about 100 degrees, but we concluded that this was no place to try to sleep in a house, so we chose the ground for a bed and the sky for a roof. After a lunch we sought out, by the aid of an auto torch, a row of date palms which had been planted on this ranch some twenty years ago. These trees had been watered, and on each hung from three to ten great bunches of ripening dates. For one I regretted that I had already eaten heartily or even at all and had not saved all my available space for dates. Of all the fruits and vegetables of temperate, semitropical and tropical countries these fresh dates were about the most melting and delicious, and the most satisfying. Moreover, you can eat fresh dates until you can eat no more and yet feel no sickishness, notwithstanding that the date is from 50 to 70 per cent sugar. After eating all that we could hold, which of course made no impression on the great bunches, we stretched out on the ancient desert floor, the stars shining out of the blue black sky and looking very bright and near.

YOUNG TREE OF RICH PROMISE

The Government is carrying on experimental work and this is one of the products.

In dateland it is always a "date garden," never an orchard or a grove; and more than once I looked almost expectantly to see the turbaned head or the

burnouse of some Arab attendant, who it seemed to me should surely be present in these Gardens of Allah, so Oriental and so un-American seemed the surroundings.

Uncle Sam maintains an experimental date garden in the Coachella Valley, and here and in several other localities is carrying on work of the highest value to the young American date industry. Mr. Bruce Drummond, the manager of the Coachella government garden, told us one striking thing of the many that we didn't know about date trees—that each bunch must be pollinated by hand—that is, a piece of the blossom from a male tree tied to each female cluster. Being one of the oldest of fruits, there are hundreds of varieties, and it is of the utmost importance to find out which of the best of the varieties will thrive under the soil and climatic conditions found in each date region, for the bringing into bearing of twenty or forty or eighty acres of dates is something of an expense. Over 200 varieties of dates have been tested out by the Government and private individuals, while there are at least 300 more kinds. Out of all these only about a dozen seem to warrant planting in commercial quantities, of which, perhaps, the Deglet Noor is the general favorite. There are 5,560,000 Deglet Noor date trees growing in the Sahara desert, yet it is said that they grow to a perfection in the Coachella Valley that even visiting Arabs admit is unrivalled.

Delicious beyond compare, the date has also a real food value. The Arabs of the Old World use dates for more than one-third of their food. The very sugary varieties are especially adapted for carrying on long journeys and are called by the Arabs "bread dates." They preserve themselves and will keep indefinitely.

Up to this time the market for the choice varieties of Coachella Valley and other American dates has been so strong that it has been impossible to supply the demand for them at high prices, and the indications are that for a time the market will grow faster than the product will increase. But the Coachella Valley is a vast valley and the water supply appears to be inexhaustible, coming in underground channels from the snow reservoir of the Southern Sierra, and there seems no good reason why the date-producing area should not increase tremendously in the next few years.

DATE-TIME IN THE COACHELLA

That is, picking dates, done frequently by these Los Angeles girls.

Authoritative statistics are not at hand for large date gardens in the United States, but since many full-bearing palms produce 200 pounds or more of fruit a year, it does not seem unreasonable to estimate an average of 100 pounds a tree for an orchard of well selected palms, properly cared for. Fifty palms to the acre with an average yield of 100 pounds totals 5,000 pounds, and if sold as low as 15 cents a pound on the spot will give a gross return of $750 an acre.

There is every reason, therefore, to expect Coachella Valley dates to retail at from 25 to 40 cents a pound, according to quality and the fancifulness of the package in which they are marketed. At the present time the man who has a 10-acre date garden in full bearing and who is getting 75 cents a pound, as some growers in the Coachella are, has a veritable gold mine and is making an annual fortune; but $750 an acre is not an income to be overlooked, so that even with a prospect of only 15 cents a pound it is probable that great areas will be planted to dates as fast as the land can be prepared and desirable young date trees procured. And the Coachella Valley is only one date area. The Department of Agriculture states that besides this valley several other hot interior valleys of California will see the successful commercial culture of dates, as well as the valley of the Colorado, to the Nevada line, the Salt River Valley and the Gila River Valley in Arizona. So that we may reasonably look forward to being able to buy American dates in the not very distant future at prices within the means of our average pocketbook.

"HE STARTED TO RUN, AND FOR ABOUT FIFTY YARDS HELD HIS OWN"

A Four-footed Demon

By C. R. ASCHEMEIER

U. S. National Museum

WERE IT not for a trusty and dusky native with the Kiplingesque name of Pambo, I would be buried on the plain near Ntyonga in the French Congo. There is nothing more drear than the funeral of a white man in the jungles, and a little graveyard stands as a grim reminder of those who tried to conquer this part of the world. This is by way of leading up to the introduction of the near cause of my demise—the gaboon or West African buffalo, four-footed demon who will "advance to the charge" until hunter or hunted has been accounted for.

For more than two years we sought flora and fauna in the Congo, roaming this country of the gorilla and the chimpanzee. The natives, not being overly fond of work, proved of scant value as a source of "chop." We had to forage for food ourselves. So the gaboon became a useful source of supply, as well as being an interesting addition to our collection, and one always certain to furnish a dangerous thrill on meeting.

The natives call this buffalo of the West African fastnesses "N'yari." They fear him more than the gorilla or the elephant, and well they may, for, with the possible exception of the leopard, he has accounted for more of them with his horns than any other animal of that section. Smaller than his cousin, the cape buffalo of East Africa, the gaboon stands about four feet at the shoulder. Still, what he lacks in size he makes up by being sincerely vicious when aroused.

I had been plentifully warned about this fellow, but, like most collectors, I grew a bit careless. One day Pambo and I saw a herd on the plain and maneuvered quite close. Keen of eyesight, the gaboon is infinitely more keen of scent. Sometimes I have been seen by them and have received no notice save a mild curiosity. But once they get the man scent they do one of two things—depart hurriedly in a bunch or alone, or leave it to the "old man" of the party to take care of the invading human with a vicious charge of lowered horns.

The herd Pambo and I had stalked were in a patch of tall grass. We needed food, so, taking careful aim at what I thought to be a bull, I fired. Down the animal went, and we approached. It scrambled to its feet and I fired again, then followed the gaboon out on the open plain, where it was apparently waiting for us. Lowering its head, it made a charge toward me. My last cartridge was gone. Then Pambo took over the situation. Before he could

THE PUGNACIOUS GABOON BUFFALO OF WEST AFRICA

Known to the natives as "N'yari," it is more feared than the gorilla or elephant.

swing his rifle into use, the beast was nearly on him. The native started to run and for about fifty yards held his own. The gaboon began to gain and lowered his head for the toss. Pambo, with a fleeting backward glance, saw his predicament. He doubled sharply. The gaboon could not. Down it went and Pambo quickly assured us of gaboon steak.

To my surprise the animal turned out to be a rather large cow. I made the mental remark that if a cow buffalo could do what she had done, a thoroughly enraged bull might provide far more dangerous entertainment. Not long afterward I had the dubious pleasure of meeting one. He was grazing alone on the plain, not far away. Pambo went to head him off and I maneuvered into range. He spied me. For one of those moments that seem like hours all that I could see was a dark brown streak coming my way. I started shooting, knowing that on quickness depended my life. The fifth shot was successful, but the bull was only a few feet away when he dropped.

This buffalo is sometimes referred to as the "bush cow." It is appropriate, for they are usually found in the bush during the day and graze on the plains in the late afternoon and night. There are, however, exceptions, and several times I have run into them lying in the tall grass during the hottest part of the day. White, instead of red, is the color that is said to infuriate them.

During our roamings in the French Congo we found the gaboon grazing and wandering alone or in herds of ten to seventy-five. Theodore Roosevelt spoke of the cape buffalo of the East African coast as being a worthy foe, and the gaboon of the west coast equally deserves this title. About thirty specimens of the gaboon were brought back for the Smithsonian Institution, the largest collection of them ever assembled for an institution of a scientific nature.

THE MOON was up, the winter winds, too. We were returning home through the narrow wood-road when, as we swung into the driveway, the headlights picked out a half-dozen strange shapes under the lee of the stone wall. Fox hunters, bundled up against the weather, lying here out of the wind, listening to the baying of the hounds! The pack was a mile away among the quarries. No man of them had a gun—only the white moon, the scudding sky, the wind in the elms, and the far-off rise and fall of the baying, the elemental music of the chase.

These men were of all sorts, but all of them members of a local fox-hunting club, numbering, I have heard, more than a hundred strong. I doubt if there are ten foxes this fall in all of this neighborhood, a shot for ten of the hundred hunters. And after that no more sweet baying of the pack beneath the watching moon, no line of sharp tracks across the snow, no lithe red form, keen faced, brushy tailed, trotting under my lower meadow bars!

Here is a fox club which has learned to hunt without a gun, else it could not hunt at all. A live fox in the woods is good hunting so long as he is alive. A gray goose honking down the sky is better sport than the same thing trussed upon a table.

Stop killing and start creating. Stop cutting and start planting. Stop wasting and start saving. Stop hunting and start watching. Stop hating and start loving. These are the ten commandments of conservation for each of us within his own dooryard and neighborhood, over his own ranch and farm; a sower of seed, a planter of trees, a nourisher of life, where heretofore we have each plucked and burned and slaughtered.

Whoever pollutes a stream poisons a people, no matter how many wheels the water turns, how many mouths the mill may feed. Mill-dam and fish-way can be built as one piece, a corporate part of a single undertaking for a life that is lovely, and a living that is more than bread.

For every stick of timber cut a seedling can be planted. And even if, in the wiser future, we can declare the open season on certain forms and in certain places, every thoughtful sportsman knows that today, should the shooting he desires for himself be claimed by us all, it would make a wild-life morgue of America before the pup he is training has been broken to the gun.

We still need legislation for the saving of wild life. Yet salvation is not in the law. It is in love. The law protects; the same law prescribes. We must abide by, but we dare not abide in, the law. Both right and wrong bear the name of the law. Love runs ahead of law, requires no law, and not only protects but plants and makes alive. We shall always need the law, but at this moment we need love infinitely more.

Let us enact conservation legislation at Washington. Meanwhile, in every schoolroom up and down the land, and across from shore to shore, let talk about birds and beasts and flowers and trees be started, let tramps afield be taken, and so, in every school-child's heart let love be planted, till knowledge of conservation be next to reading, writing and arithmetic, and love of nature next to love of God and neighbor. That for the future.

For the imperiled present what am I and my town doing? You and your town? Hingham has a three-thousand-acre Wild Life Sanctuary, a Town Forest, an After-church Field Club, a Garden Club, a chapter of the D. A. R. making conservation a major theme, and beekeepers and bird-lovers not a few. And I have a seven-acre woodlot, deeded in my name and dedicated to trees and all wild neighbors; to be willed to them, their heirs and assigns to grow and nest and den thereon *in perpetuum*.

Seven all-but-useless acres that cost three hundred and fifty dollars—a year's fee for the country club! Seven acres in twenty-year-old growth of gray birch, red and white oak, maple, ash, hickory, flowering dogwood and pine! A rocky, irregular piece, full of rabbit, skunk, and woodchuck dens! A piece that last season was a home for one precious partridge nest, one cuckoo, one turtle dove, and at least one red-eyed vireo nest! Seven acres of growing trees, future timber, that would have been felled last winter had I not ransomed them! Seven acres of thinning, trimming, and trash-wood for kitchen stove and fireplace! Seven acres of leafy shade, and leafy smells, glorious in the spring with white dogwood, gorgeous with burnished colors in the autumn, and lovely in every slender trunk and budded twig standing etched against the wintry hillsides in the snow! Seven acres of work and watching and wealth—if joy is wealth, and health is wealth, and 6 per cent on your investment is wealth, which is a low rate to reckon the trash-wood returns! Seven acres left wild for all wild things—that is my small contribution. But oh, the difference to the landscape, to the woodchuck, and to me!

THE AMERICAN NATURE ASSOCIATION

OUR PROGRAM

THE AMERICAN TREE ASSOCIATION

(The following statement sets forth the general aims of these two associations with respect to conservation and forestry and their endorsement of specific activities and pieces of legislation now pending designed to carry these aims into fullest effect.)

I. Active cooperation and leadership in the great movement to encourage and promote sane and healthful out-of-door recreation especially through the encouragement of Nature Study in every family, in every school, normal school and summer camp.

II. A constructive policy for forest protection and extension to increase appreciation of forests and wild life as Natural Resources essential to the sound economic future of our country.

Specifically:

1. Make the McNary-Clarke Act Effective

The McNary-Clarke Bill became a law last June, when President Coolidge signed the act with a wooden pen which is now framed in the office of the American Nature Association and the American Tree Association in testimony of the splendid part played by the members of these associations in bringing about favorable action by Congress. The Act provides for federal cooperation with the States in forest protection on a fifty-fifty basis. Yet, as in the case of the Good Roads Act, no state can benefit by the provisions of the McNary-Clarke Act without doing its own part.

We must demand from the legislatures of each state that they act to accept the federal help offered, and appropriate their half of the expense.

We must also see to it that the Federal Government actually appropriates the maximum sums authorized by the act.

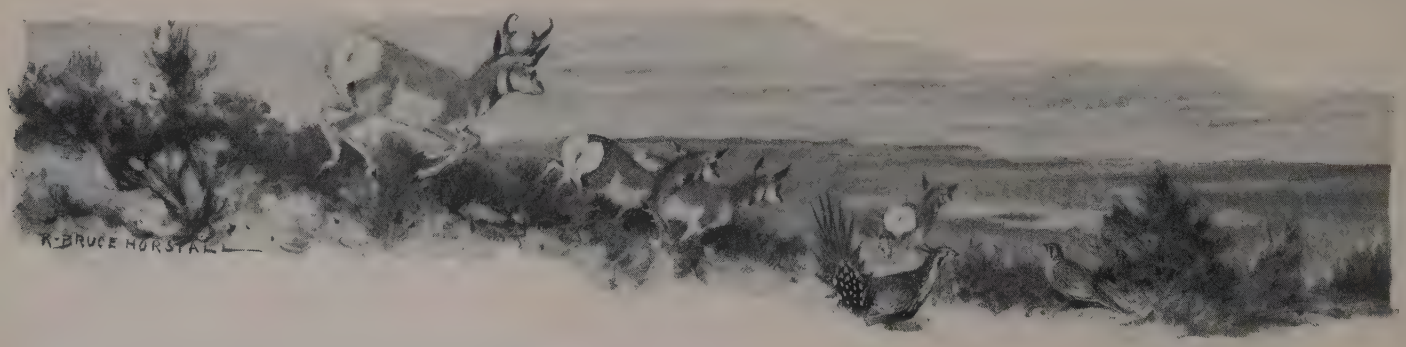
We must individually pledge out utmost endeavor to continue our educational compaign in behalf of forest fire prevention. State nurseries for the public distribution of seedling trees for reforestation and encouragement of the proper management of the farm woodlot as a sound agricultural principle.

In spite of a desired increase in public ownership of forest land, the backbone of forest utilization from the economic point of view is still private forestry. It should so ramain. To this end, study of forest taxation to encourage the practice of private forestry by corporations and individuals, is essential. This feature, included in the McNary-Clarke Act, should have united support.

2. A Bill for National Forest Extension.

The McNary-Clarke Act again endorsed the principle of National Forest extension, particularly in the east, and extended its scope, but did not actually appropriate the money needed therefor. The National Forest Reservation Commission has long maintained that a minimum appropriation of $2,000,000 a year was urgently needed, and that with any smaller amount no really efficient program could be undertaken. In spite of this fact appropriations since 1919 have averaged less than half a million dollars per year.

A bill is now being introduced in Congress which will authorize a federal appropriation as follows: $3,000,000 a year for five years, and thereafter $5,000,000 a year for five years—inn all $40,000,000. All agencies interested in forest conservation are heartily in favor of this plan. The total expenditure is less than the cost of a single



battleship, and an even more effective investment in future econmic security.

Remember we have in this country over 80,000,000 acres of forest land lying absolutely denuded and idle. The expenditure of the entire $40,000,000 is, in comparison with this gigantic problem, only a drop in the bucket, but it is at least a real forward step.

3. A Nation-wide Movement for State and Town Forests. National Forests alone cannot cope with our overwhelming need for leadership and example in forest protection. It is right to expect Uncle Sam to do his part on a large scale, but so long as all forests are not large units, and so long as we do not intend or desire that a great impersonal federal government should stretch its hands into every nook and cranny of our lives, why cheat ourselves of the pleasure and satisfaction of local accomplishment?

The ownership of forest land by state or town is more closely the ownership of the people. Local conditions best determine whether the state or town plan is more satisfactory, but in either case the argument is the same—the practical working out of *fundamental American principles.*

The State or Town Forest stands at the threshold of the American home. It is the property of the people, maintained for the people and operated for their common benefit. It is their's, within their reach, to use, to enjoy and to protect.

It pays its own way, yielding a regularly maturing crop of timber on which, for local consumption, no railroad collects the freight.

It stands as a constant lesson in forest protection and respect for common rights, which may be neither wasted nor abused.

Without conflict, healthful recreation and pleasure may here go hand in hand with common dollar profit.

It is a vital aid in the education of school boys and girls, both as a place to study nature and to play.

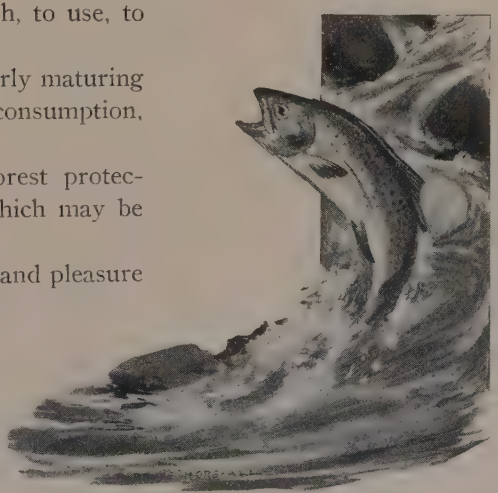
It naturally becomes a sanctuary and refuge, not only for humans young and old, but for the birds and all forms of wild life.

III. Endorsement of legislation for Wild Life Protection as fostered by the National Conference on Outdoor Recreation and the National Association of Audubon Societies.

Specifically the following measures:

1. The Migratory Bird Refuge and Public Shooting Grounds Bill. This measure is now pending before Congress, the House Bill being numbered H. R. 745, the Senate Bill S. 2913. The House Bill, with certain amendments, was reported favorably by the House Committee on Agriculture, May 14, 1924. It has almost unanimous endorsement by all agencies interested in or familiar with the situation. The primary purpose of this act is to authorize and provide means for the public acquisition of some of the marsh, swamp and water areas essential to the existence of migratory wild fowl. Through such acquisition, indispensable areas will not only be protected from drainage but will be permanetnly available as public shooting grounds. The bill is one which every public-spirited and forward-looking organization could and should endorse and support.

2. Bill Authorizing Acceptance of Private Lands for Game Refuges. There is now no legal authority under which the United States may accept title to private lands which the owners thereof desire to donate for game refuge purposes, even when such acceptance is wholly and strongly in the public interest. To remedy this condition, Senator Sheppard of Texas, on June 3, 1924, introduced a bill, S. 3446, which would authorize the President, upon recommendation of the Secretary of Agriculture, to accept lands donated to the United States as preserves or refuges for wild birds and animals and for other purposes. Such authority would make it possible to greatly increase the effectiveness of refuges containing private lands within their limits.



3. A Bill to Regulate the Use of Unappropriated Public Lands. The unreserved and unappropriated public lands of the United States still exceed one hundred and seventy-five million acres in area. Through long-continued and wholly unregulated use for grazing purposes, the vegetation on these lands has diminished in quantity and deteriorated in character to such a degree that the lands are incapable of supporting more than a tithe of the game animals or birds which, under better regulation could find habitat thereon. Under regulations, the unreserved lands would support more game, more domestic stock and more families than at present. Legislation to this end, therefore, should be

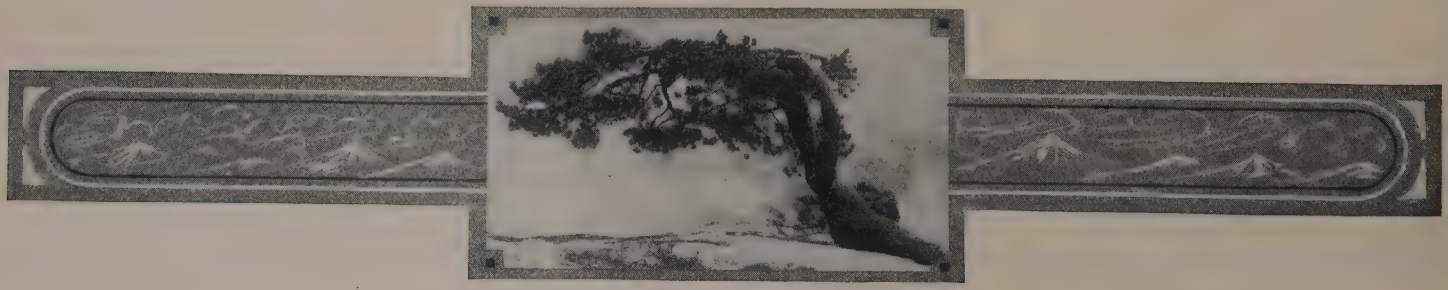
endorsed with the hope that the Department of Interior and the Department of Agriculture will shortly agree upon the details of legislation and jointly recommend a definite bill.

4. A Bill Authorizing a National Arboretum and Botanical Park. Naturalists have long appreciated the need for a National Arboretum and Botanical Park in which to collect and study the plant life of the country. The large number of scientific and technical organizations centered in Washington make it desirable that the institution be in that city. The reclamation of the Anacostia River flats now being carried on by the War Department is gradually making a considerable acreage of land available to the Government, but this reclaimed land does not present a sufficient diversity or variation to completely meet the requirements of an adequate arboretum and botanical park. Adjoining the reclaimed land, however, is 367 acres of high and wooded land which in combination with the flats would afford every soil type and condition necessary for the arboretum and park. It is proposed that the purchase of this land be authorized by Congress and that after purchase this land with so much of the reclaimed flats as may be needed, be set aside as a National Arboretum and Botanical Park.

5. Roosevelt-Sequoia National Park Bill. For the past six or eight years, proposals have been pending for the addition to the Sequoia National Park, in California, of considerable areas of adjoining lands on the headwaters of the Kings and Kern Rivers, now forming parts of the Sierra and Sequoia National Forests, and the designation of the enlarged area as the Roosevelt-Sequoia National Park. The bill now pending before Congress, H. R. 4095, defines boundaries mutually acceptable to and approved by the National Park Service and the Forest Service, and will increase the area of the Park by approximately 550,000 acres. At the last session of Congress, the addition was opposed by the irrigation interests of the San Joaquin Valley, but otherwise the prevailing view was favorable.

6. Select Congressional Committee to Investigate Fish Situation. The fish situation is now what the Forestry situation has been. The power of executive action rests largely with the several states, but the requirements of the situation are national in scope. In the case of Forestry the object was accomplished by the appointment of a Senate select committee of five, which visited every center of forest activity in the United States, held extended hearings, published detailed reports of those hearings, and finally drafted the McNary-Clarke Act, which, upon passage by Congress, established a new and sound basis for a national forest policy. A similar procedure for working out suitable legislation in relation to fish is advocated.

7. The Alaska Game Commission Bill. This measure, S. 2559, which authorizes the creation of a game commission to cooperate with the Secretary of Agriculture in the administration of the game resources of the territory and establishes certain fundamental principles of game administration, passed the Senate last May and has been favorably reported by the House Committee of Agriculture. It should come up for consideration during the present session. An interest in its adoption is desirable and will increase the probability of its enactment.



Forests—State and Town

By CHARLES LATHROP PACK

NATIONAL forests totaling more than 150,000,000 acres have been created and set aside as timber reserves, managed and cut as constant sources of supply for the whole country. They are a vital factor in the forest program of the nation. Their extension and protection are important. Yet the National Forest cannot be everywhere established. There are many sections of the country where they cannot be acquired economically and must be supplemented by forest areas nearer to the people; closer to the centers of demand. Such areas are comprised in State, City and Town Forests.

The rapid march of industrial progress in the United States has resulted in the virtual denuding of forest areas in the eastern and middle western states and the concentration of the remaining great forest resources in the south and the far west. The sections of the country where the timber WAS must now pay toll in high freight rates to get the timber from the sections where it now IS. Yet within the borders of the states, whose conditions force them to pay this cost, there are hundreds of thousands of acres fitted for nothing else save the production of timber—liabilities, not assets.

Awakening to this situation some of the states have embarked upon definite policies of state forest acquisition. Massachusetts, New Hampshire, New York, Pennsylvania, Michigan and Ohio are notable among these states—facing the fact of virtual denudation and building from the barren forest floor up. Certain of the western states still have forest land with the title vesting in the state and have set aside portions of these areas to be perpetuated as State Forests.

Totaling the area of State Forests, however, shows only a few hundreds of thousands of acres so set aside. Before those states that have adopted programs of pregressive acquisition lies the task of extension; before those that have made a scant beginning or none at all lies the task of arousing public sentiment, of sweeping aside legislative or constitutional barriers and of adopting forward-looking policies. Indiana, for example, is calling upon her legislature to authorize building upon a good though small beginning in State Forests. The people of Wisconsin have adopted in referendum a measure permitting acquisition of such areas. There is active agitation in Illinois and in several of the southern states for action.

The State Forest is an essential complement of the National Forest. It is closer to the people and to the meeting of their needs. Yet, being the common property of the people of a sovereign state, it can be, if sentiment demands, large enough to be economically valuable and profitably administered. It becomes a valuable timber resource as a factor in balancing the dislocation of supply, a profitable asset to the state and a recreational area of inestimable value.

Creation of State Forests must be prefaced upon an aroused and intelligent public opinion. Through the awakening of this sentiment active departments of forestry are established; constitutional barriers are removed and enabling legislation is enacted. Then this sentiment must support the hand of competent foresters in the management of these people's forest and assure adequate funds for the maintenance and extension of the State Forests until they have reached proportions in keeping with the needs of the State and conditions of growth that will insure a yield in perpetuity under proper supervision.

In some states the State Forest represents the most practicable means of supplementing the National Forest and private forestry. Frequently the land suited for forest growth is so located in one section as to make State action most advisable. Often the industrial development of the State directs a similar course. In many of the States, however, there is another forest unit of remarkable value—the Town Forest.

In several of our states, notably Massachusetts and New York, the town forest movement is under way. Taking a page from the experience of several European countries, where there are instances of the town or communal forest relieving the people of the community of taxation, providing them with a cheap source of wood supply and giving them a site for local recreation, nearly 200 American communities have established local forests. There are nearly

a half million acres of this type of forest—a small number comparatively, but a beginning.

Establishment of the town forest means the setting aside of a tract of land by action of the community for the specific purposes of wood production. In some states an enabling law is necessary to permit the communities to take such a step. This, however, is a simple piece of legislation, giving permission and requiring no appropriation. Frequently it is entirely unnecessary, leaving the initiative to the local communities themselves.

But why should a community create a forest?

In many cities and towns there is land that has reverted to the community for non-payment of taxes, or land that is lying fallow and paying only a mite of return in taxes. The first type of land has become the locality's own and the second can be acquired for a very little. Most communities own properties in the form of hospitals, asylums, poor farms or other institutional establishments, frequently with extensive grounds more often than not doing no productive work. Most cities and towns have water reservoirs that must be protected by a watershed of trees in the interest of public health. In some cases the community is so situated that the protection of timber growth as a barrier against the elements is advisable.

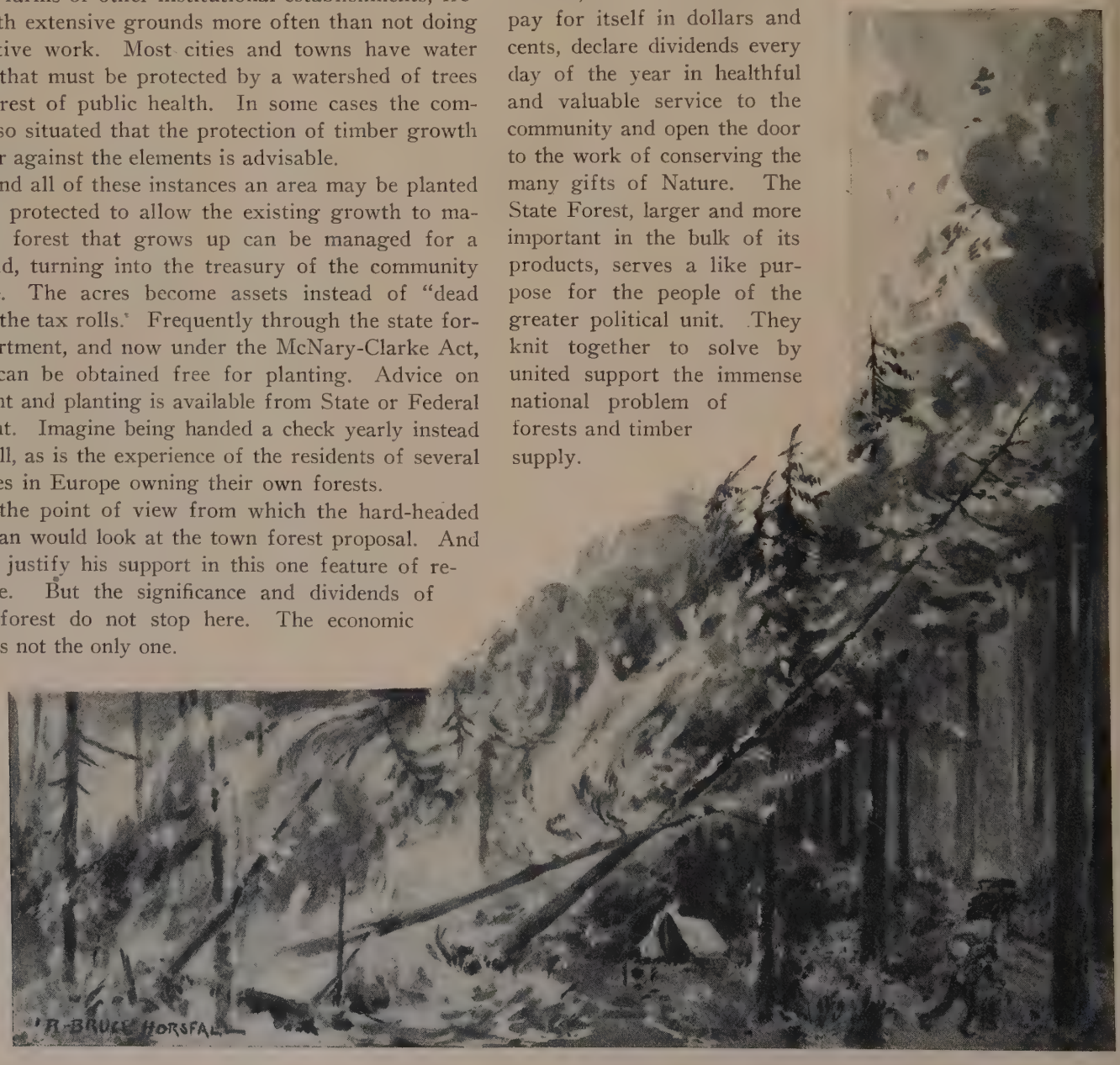
In one and all of these instances an area may be planted to trees or protected to allow the existing growth to mature. The forest that grows up can be managed for a yearly yield, turning into the treasury of the community an income. The acres become assets instead of "dead heads" on the tax rolls. Frequently through the state forestry department, and now under the McNary-Clarke Act, seedlings can be obtained free for planting. Advice on management and planting is available from State or Federal Government. Imagine being handed a check yearly instead of a tax bill, as is the experience of the residents of several communities in Europe owning their own forests.

This is the point of view from which the hard-headed business man would look at the town forest proposal. And its returns justify his support in this one feature of returns alone. But the significance and dividends of the town forest do not stop here. The economic argument is not the only one.

Forest conservation and protection is a paramount issue in our nation. It is a matter of education. The town forest is a text book. Will the members of a community jointly owning a town forest tolerate for one minute the citizen who leaves a match smouldering in their forest? No, their protective interest will be quickly aroused and must inevitably spread to a like interest in the larger and less personal areas of forest that they own as people of a state or the nation, or that their neighbor owns.

Going farther than this feature of general education, the town forest becomes an adjunct of the schools. Within its confines nature and forestry can be studied. Having been set aside and protected, the area becomes a sanctuary and refuge for wild life of all kinds. It becomes the center of the recreational activity of the community—as well—forming a vital link in the great movement in the United States toward the out-of-doors.

Thus, the town forest can pay for itself in dollars and cents, declare dividends every day of the year in healthful and valuable service to the community and open the door to the work of conserving the many gifts of Nature. The State Forest, larger and more important in the bulk of its products, serves a like purpose for the people of the greater political unit. They knit together to solve by united support the immense national problem of forests and timber supply.



Nature Study Review

Anna Botsford Comstock

Nature Study Society Meets

The American Nature Study Society meeting held under the auspices of the American Association for the Advancement of Science, in Washington, December 29 and 30, marked a distinctly constructive step in forwarding the cause of Nature Study. Most significant and interesting were the reports of the committees which had been appointed during the past year by President Van Cleve. The report of Miss Celia Paroni was indicative of the rapid strides being made by Nature Study throughout the nation. Prof. E. Lawrence Palmer, of Cornell, contributed two most interesting papers. The first of these was a preliminary report on State Programs for Nature Study, showing that an ever-increasing number of states were actually putting into force a definite plan of Nature Study. While it was pointed out that a plan on paper did not always mean a plan in actual practice, and while in one or two instances the programs adopted by the states were not based upon the most reliable text-book material, nevertheless distinct progress was shown. Professor Palmer's second paper gave a detailed survey of the relative interest shown by teachers and pupils in Nature Study in both the rural and city schools of New York State. Professor Palmer brought out very clearly that the actual preferences for different forms of Nature Study shown by both the rural and city schools did not accord with the previously considered notions on that subject. Most significant of all, perhaps, were his figures illustrating that the larger majority of the questions which he had analyzed dealt with the habits of animals, birds and plant life, rather than with nomenclature or with purely economic value. Mrs. Alburtiss, of Washington, made a most interesting report on the principles underlying the preparation of courses in Nature Study.

Mrs. John Dickinson Sherman, president of the General Federation of Women's Clubs, read a large number of endorsements of Nature Study from leading educators in different parts of the country. The collection of these endorsements will be of immense value to the Nature Study cause.

Other interesting addresses included that by Vernon Bailey, Chief Field Naturalist of the United States Biological Survey. Mr. Bailey chose as his subject, "Our Friends and Enemies Among the Mice," illustrating his talk with caged specimens of the grass-hopper mouse and the common field mouse, which he highly recommended as pets, far more interesting and intelligent than guinea pigs. Dr. Harry C. Oberholser spoke on problems of conservation, dealing particularly with recent propaganda for the destruction of crows, and urged a moderate view with regard to conservation which should take into consideration the fundamental laws of nature rather than the desire of man to preserve some one species at the cost of another.

The meeting was also addressed by Mrs. Elizabeth K. Peeples, of Washington, D. C., who pointed out to the members of the society the large amount of useful nature study material available in Washington, both in the government department and through the agency of NATURE MAGAZINE. Subsequently Mr. Arthur Newton Pack, Associate Editor of NATURE MAGAZINE, addressed the meeting on the subject of the relation of the National Conference on Outdoor Recreation to Nature Study.

The proceedings of this meeting of the American Nature Study Society will be published in full, including the reports of the various committees, in a bulletin which will be jointly published by the American Nature Study Society and the American Nature Association. The publication of this bulletin will be announced in the March issue of NATURE MAGAZINE, and all interested persons will be informed how to secure a copy. It is something that no teacher of Nature Study, whether in school or camp, can afford to be without.

To Know and Not to Know

People may be divided into four classes; those that know and know that they know; those that do not know and think that they know; those that do not know and know that they do not know and are afraid to admit it; those that do not know and freely admit it. The success of a nature study teacher depends much upon the class to which she belongs; to be most successful she should belong to either the first or the last.

One stumbling block, nay, one mountain barrier to the introduction of nature study to the schools has been the conscious lack of nature knowledge on the part of the teacher in the grades. This lack of knowledge has inevitably resulted in a lack of interest. As a matter of fact, until recently there was no part of her educational training that was calculated to make a teacher familiar with the common things out of doors upon which rational nature study is based. Her botany and biology gave her knowledge for the most part along the lines of structure and physiology; and except as she gained from these subjects items concerning the growth and development of plants and animals, there was little that could be made over into interesting work for children. This limitation brought about a too great abundance of lessons on sprouting seeds in nature study in the grades twenty years ago. Once we asked a boy if he was going on with the nature study and he answered emphatically, "No, I am through with it. I planted beans in the kindergarten, in the first grade, in the second and in the third grades. I know all about sprouting beans and all about nature study." For a period of years it is to be feared that most pupils in those schools where nature study was introduced believed it was confined to sprouting beans.

It was not to be expected from the training in science which the grade teacher received that she should achieve any fair idea of how little, after all, the scientists themselves had pushed back the curtain of ignorance in the natural world. It was reserved for the students in universities, who were studying with specialists whose names were known throughout the world, to be amazed at the simple manner in which such a savant would say "I do not know" when asked a question that his knowledge did not cover, even in his own field. It is only the great man in science who knows and realizes the limitations of human accomplishment in solving the multi-sided riddle of the universe; and he knows that the results of his own ability to work efficiently lies in his frank acknowledgment of the boundary to his own ignorance.

Very different is the attitude of the grade teacher. She believes she is expected to know everything about every subject that she teaches, and she has little conception of the vast regions of natural science still beyond mortal ken, nor of the vast amount already known. The old-fashioned naturalist had the ideal knowledge for the teaching of nature study, but he has vanished from the world of science; and if he is ever again developed it will be because he is fitting himself to teach nature study. The field of science is so great now that each investigator is a specialist and is interested only in his own particular section of it.

However, nowadays the teacher will learn that a spirit of investigation is worth far more in nature study than any amount of exact knowledge given didactically to children; and they are learning the value of saying frankly "I do not know" to many of the questions that arise during almost any nature lesson. The best teacher, the one who is most closely in touch with her pupils, says "I do not know; let's find out." "Let's find out"—there is magic in the words. Most children will work eagerly to be able to tell the teacher something she did not know; and, if she is properly appreciative of the knowledge, there is at once a relationship of comradeship established between her and her pupils that will prove of inestimable value pedagogically, as well as humanly.

The teacher need not fear that her pupils will lose confidence in her when she says "I do not know," if she emphasizes the reason—that Nature is so full of secrets as yet undiscovered that no one can be expected to know all. We have on occasion conducted children from five to ten years of age on field trips; never once did we go out thus that we did not have to confess ignorance when certain queries were put to us. Yet these same children were always coming with questions and never lost confidence in us; meanwhile they gained a very definite idea of honesty and of the vast amount still "Unread in the manuscript of God."

All of this does not mean that the nature study teacher should take pride in ignorance; quite the contrary—she should master all of nature lore possible and develop an acute interest in adding to her knowledge year by year. What it does mean is that she need not hesitate to teach nature study because she is not as yet prepared. If she encourages her pupils, they will go on learning by themselves. What the nature study teacher needs most is to be sympathetic, interested, alert and honest.

A Nature Cross-Worder for You

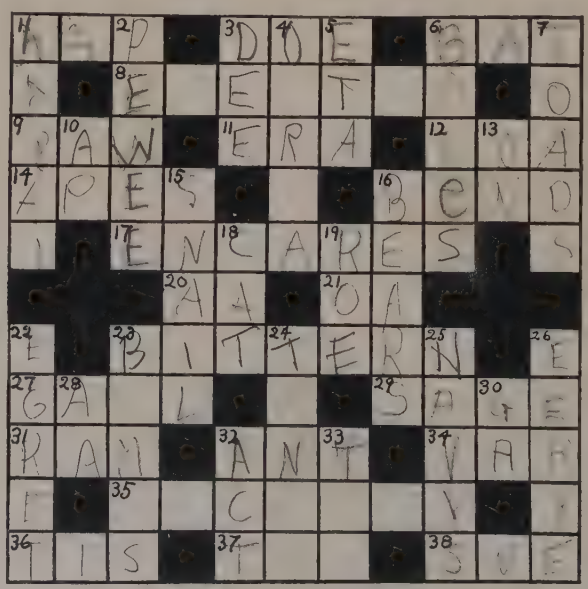
Of the forty-four words in this puzzle more than one-half relate to Nature

A PRIZE

of one annual subscription to NATURE MAGAZINE for yourself or whoever you wish to present it to for the FIRST FIVE CORRECT ANSWERS received at this office. NEATNESS must be considered in judging the solutions. Address: CROSS-WORD PUZZLE EDITOR.
Nature Magazine, 1214 16th Street, Washington, D. C.

Across

1—A snake of the Nile.
3—Mrs. Deer.
6—Mammal that flies.
8—Daughter of Agamemnon.
9—Common European bird.
11—Epoch.
12—Large snake.
14—Tailless monkeys.
16—What you can do to a Damascus blade.
17—To place in care (Obs.).
20—Associates of Arts (abbr.).
21—On account (abbr.).
23—Bird of the heron family.
27—"Omnia —," in English.
29—A desert growth.
31—Father sheep.
32—A busy insect.
34—Abbreviation of the first name of a kind of thrush.
35—Pig-like animal.
36—It is.
37—Simply though.
38—Mother, sister, wife and daughter.



PUZZLE BY DAVID J. MORRIS

Can you make up a cross-word puzzle, using Nature subjects for the majority of the words?

Down

1—North African antelope.
2—Phoebe.
3—A famous miller.
4—A sheath around the petiole.
5—Greek letter.
6—Infants.
7—Some are horned.
10—A news service (abbr.).
13—Upon.
15—He carries his house with him.
16—Don't let them hug you.
18—A live mouse trap.
19—Fish, some day.
22—A heron sacrifice to fashion.
23—Noise made by bittern (pl.).
24—Fresh water fish.
25—"An admiral of the Queen's —" (possessive).
26—Eagle nest.
28—Same as 20 across.
30—The state the "peaches" come from (abbr.).
32—Deed.
33—Part of a Chinese religion.

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Hints to Teachers on Nature Subjects

By ELIZABETH K. PEEPLES
Instructor of Natural History, Washington, D. C.

This discussion of articles in the Magazine, together with hints to teachers on how to use them in their class work, is proving most helpful in Educational Work

The Return of the Wapiti Here is as fine a lesson on the protection of wild life as a nature teacher may hope to find. Just as the interest of the people who crowded round the train in which the elk traveled from St. Anthony, Idaho, to Joseph, Oregon, was aroused in the protection of the wapiti and other game, so is the same interest awakened by this detailed account of how the elk herds were taken under guardianship of the United States Government, and how a herd was carried to Billy Meadows' Pasture. The story, told by two who lived it, grips one with its reality. Children who have read it, or heard it read, will want to study elk, and much information concerning the animals is given incidentally in the article. One learns from it the origin of the names elk and wapiti, the original and present ranges of the animal, something of its food habits, disposition, and conduct, and is led to a deeper appreciation of the harmony of the elk's beauty with that of the wild country which is its home. The pictures are helpful in studying both the physical characteristics of the animal and its habitat.

* * *

Hepatica, Harbinger of Spring Hepatica appears so long before other wild flowers that it constitutes a genuine luxury on the nature program of January or February. The ideal lesson is the one given in the woods where the children may discover the delicate blossoms for themselves; but if for any reason this is impossible, hepatica may be transplanted to a wild flower garden. Such a garden, intelligently made, is a project rich in possibilities for a Nature Study class. The plant gives opportunity for study of special adaptations, such as the fur overcoats of the buds, and the protection afforded by the perennial roots. It sharpens eyes that endeavor to distinguish its two species. Its many insect guests are good subjects for further lessons. A plea for the intelligent appreciation of "wildlings" which leaves them on their stalks should be made to the class.

Bird Guests in Winter To make a food shelf, hopper, or suet rack; to place them properly and a drinking basin; and to become familiar and friendly with the birds who frequent them is a project of surpassing worth and fascination for children or grown-ups. The article suggests kinds of food acceptable to our most common winter birds, and ways of making it accessible; but it is chiefly valuable for the charming descriptions of the behavior of the guests at the banquet. Have the children read it, and encourage them to put into words, both oral and written, their own observations in the same line.

* * *

The Collie A pet collie will be as pleased to visit school as the children will be to have him. After studying his physical make-up, habits, disposition, and intelligence, compare him with some other collie, or collies, which may be brought in for the purpose. Next ask the children to collect pictures of as many collies as possible. Study these as well as the pictures which illustrate the article in NATURE MAGAZINE. Points of likeness and difference should be noted. Let the children hold an "experience meeting" in which they tell all they know of collies through personal contact and observation. Have them read the stories of Boze and of Champion Alstead Aeroplane in the closing paragraphs of the article. The following subjects, treated in the article, should be discussed by the class: the intelligence of collies, the opinion that collies are treacherous, the collie as a pal, the original use of the collie, how he became a pet, and the danger in spoiling him. The teacher may tell the class how the collie has been bred from the original "coalie," and through what modifications he has passed. Ask the class to write a paragraph answering this question, and stating their reasons. Which would you prefer to own, a homely collie that is an ideal chum, or a costly show-specimen lacking intelligence and devotion?

The Forest Primeval Junior high school classes studying forestry should use this article for supplementary reading. It will acquaint them with the character of a British Columbia coastal forest, the system employed by the British Columbia Government for protecting its natural resources, tricks of western woodcraft, a few individual plants such as red cedar, salal, and Devil's Club, and finally give them a glimpse of "the heart of the primeval." If there is a bit of *thoroughly safe* woods within reasonable distance, the children after reading "The Forest Primeval" may be divided into small groups of congenial spirits, each of which should be assigned a suitable territory for an "exploring expedition." Later oral and written reports of their discoveries and experiences are in order. Such an assignment, of course, presupposes judgment and discretion on the part of the teacher, as the safety of her class is her first consideration.

* * *

Turtles and So Forth A turtle is a form of live material easily made comfortable in a school room. Directions for making aquaria are given in Cornell Rural School Leaflet, Vol. 17, No. 1. Directions for making terraria and feeding both land and water turtles are found in "The Course of Study in Nature Study" which may be obtained for twenty cents from the Board of Education, Toledo, Ohio, and will be found by every Nature teacher worth many times the price. A snapping turtle, unless very young, is too dangerous to be introduced in person to children. The painted terrapin, the wood turtle, or the box turtle would prove much safer for study.

* * *

Red Twigs and Yellow A unique Nature lesson consists in bringing in sprays from shrubs whose twigs show bright colors against the winter landscape. After special attention to the coloring, more detailed study of the plant may be made, and the children should be

on the lookout for bright twigs out of doors. The article contains many subjects suggestive of material for study and identification.

* * *

A Four-footed Demon The bison, like the bald eagle, is a representative of American wild life and a victim of American thoughtlessness, which should be included in every Nature Study course for reasons of patriotism as well as to teach conservation. A lesson on the bison is the more valuable if followed by one on his relatives. "A Four-footed Demon" furnishes good pictures and thrilling accounts of actual experiences with a formidable member of the family, the gaboon, or West African buffalo.

* * *

Explorations in Cloudland The clouds should be observed many times a day, and with help of descriptions and pictures given in the article, named in accordance with the classification. A pamphlet giving cloud classification, and a chart of cloud pictures are furnished teachers upon request by the U. S. Weather Bureau. The closing paragraph of the article suggests the present extent of cloud study, and some interesting problems which still await solution. Few subjects offer better opportunity for correlation in the fields of literature and art, albeit in some instances famous authors and Old Masters "administer shock to scientific susceptibilities."

* * *

Date Gardens of America While the date palm would be an interesting subject for a Nature lesson, this article offers most to the geography teacher. When the class is studying southern California and Arizona assign "The Date Industry" as a special topic to an individual or a small group. Get the January number of NATURE MAGAZINE and ask for a report on the following phases of the subject:

1. Value of dates as food.
2. History of the importation of the date tree into the United States.
3. Study of date gardens of Coachella Valley: (a) Topography and climate; (b) irrigation; (c) description of trees and fruit; (d) work at United States experimental date garden; (e) method of pollinating date blossoms.
4. Probable growth of the industry in the United States.
5. Quality and money value of the American date crop.

Lincoln—1861 Hesler Portrait

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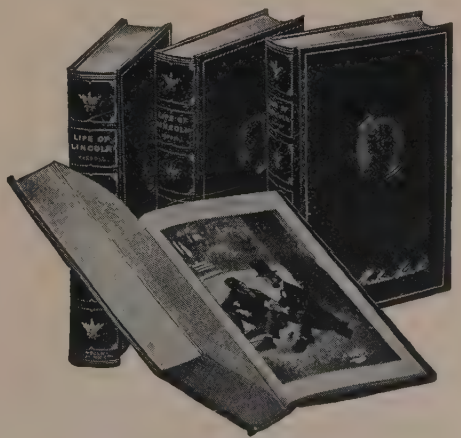

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Shrew and Whale

Thornton W. Burgess is the father of the Radio Nature League, and in response to a letter from the Associate Editor of NATURE MAGAZINE, asking just what his aims in this work are, Mr. Burgess replied: "To quote from your letterhead, they are to 'Stimulate Public Interest in Nature.'" He feels that the radio is the greatest means of reaching the public if gone about in the right way and illustrates by an interesting experience. In one of his radio Nature Talks, Mr. Burgess conducted a conversation with a real boy at the studio. The youngster asked what was the largest animal and was told the Sulphur-bottom Whale, 101 feet long and weighing about 150 tons. His query as to the smallest animal was answered with the Common Shrew, weighing about 40 grains. Then Mr. Burgess turned to his radio audience and suggested they figure how many shrews it would take to make a whale. The next day the following cable arrived: "Directors, Broadcasting Station, Springfield, Mass., Burgess: 52½ million shrews equal whale. Core, Withington, Manchester, England." This, at 20 cents a word and all words counted, Mr. Burgess says, certainly indicates that someone is interested. More power to you, Mr. Burgess.

National Parks in Winter

Public playgrounds exist in our National Parks in the winter as well as in the summer, declares Stephen T. Mather, director of the National Park Service in his annual report. He urges that more general all-year use be made of these great out-of-door properties of the people. Mr. Mather's report points out that there are few areas west of the Mississippi adapted to National Park status that have not yet been included. He states that the revenue from the parks increased about $150,000 during the last fiscal year, amounting to about one-third of the total appropriation. When roads are completed, he predicts, revenues will increase and come more nearly to balancing expenditures.

Prize Contest

Reflecting the facts brought out at the recent Wood Utilization Conference held in Washington, D. C., the National Lumber Manufacturers Association offers $2,000 for "original, practical suggestions which can be applied in American sawmill and logging operations and which when applied will result in a material reduction of manufacturing cost or saving of waste." This is a contest with nine prizes—one of $1,000, one of $500, three of $100, and four of $50. The conditions require that suggestions be specific and accurately explained and be entered at the Washington office of the association before March 1, 1925.

Recreation Conference

Unreserved approbation for the establishment of a national arboretum in the National Capital for the propagation of trees and plants was voted at the meeting of the Advisory Council of the National Conference on Outdoor Recreation, convened to start a program of future action. The Conference delegated to several sub-committees the work of carrying on research activity into the available recourses of recreation throughout the country with a view to coordinating their service to the people. The Advisory Council, of which Mr. Charles Lathrop Pack, President of the American Nature Association and The American Tree Association, is a member, delegated to the executive committee various authorities with respect to putting into effect a program to carry forward the work of the conference. The National Conference will meet again in Washington during May, and the results of the committee investigations and executive committee actions will then be placed before it. Among those who were elected as members of the Advisory Council at the recent meeting was William L. Finley, of Portland, Oreg., Field Naturalist of the American Nature Association.

Feathered Diplomacy

"To the Birds of Piney Branch—from Their Friends, Elise and Jules Jusserand."

This is the inscription on a beautiful stone bird bath that stands in Piney Branch Valley in the nation's capital. It is a memorial of gratitude left by the French Ambassador and his wife as they leave for their home country. During the trying days of the war, when shells churned the face of their beloved France, the Ambassador and Mrs. Jusserand were accustomed to seek refuge in this peaceful little valley, where the birds sang cheerily and sweetly, lifting burdens of worry and sadness.

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Condor and Airplane

Three weeks spent in the Andes Mountains convinced Maurice Boel, Belgian aviation engineer, that sustained motorless airplane flight is only possible at very high altitudes and under special favorable conditions of the air. During his stay in the mountains he was engaged in watching the condor to find out how it was able to fly continuously apparently without flapping its wings. His conclusions were that the bird attains high altitudes by its wing motions and then employs small vibration of minor wing feathers to keep going, and even then must depend upon constant atmospheric conditions. The bird cannot sustain itself in the air near the ground without flapping its wings and, when high up, economizes its energy by soaring on air currents.

Orchard Heating

The photograph used in the November issue of NATURE MAGAZINE on page 268 and entitled "An Orchard Nocturne in Colorado" should have carried the following notation: "Copyrighted 1911 by P. H. Troutman, Canon City, Colorado." Credit was given to the Round Crest Orchard Heater Company, which no longer exists.

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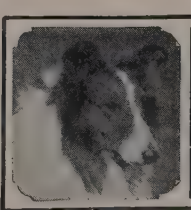

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Table of Contents

Nature Calendar		Inside Cover
Return of the Wapiti	W. L. and I. Finley	69
Hepatica	A. A. Hansen	74
Bird Guests in the Winter	E. Keil	75
The Collie	A. P. Terhune	79
The Forest Primeval	A. N. and E. Pack	82
Turtles and So Forth	R. W. Westwood	85
Red Twigs and Yellow	S. F. Hamblin	87
Penguins	E. A. Preble	89
Explorations in Cloudland	C. F. Talman	95
The Silver Pilgrim	B. H. Lampman	101
Evening Skies	I. M. Lewis	104
Date Gardens of America	G. E. Mitchell	106
A Four-footed Demon	C. R. Aschemeier	111
A Message	D. L. Sharp	113
Our Program		114
Forests, State and Town	C. L. Pack	117
Nature Study Review	A. B. Comstock	119
Hints to Teachers	E. K. Peeples	122
Nature News and Views		124

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Publication and Editorial Office, 1214 16th Street, Washington, D. C.

To a Leader

At McVeytown in Pennsylvania there stands a rough six-ton boulder to which is attached a bronze tablet bearing in bas relief the figure of a man in hunting costume standing on the rocky brink of a deep chasm. This stands as a memorial to Dr. Joseph Trimble Rothrock and was recently dedicated to his achievements as a forester and a patriot and a public servant. It is a fitting memorial in its simplicity, as simply beautiful as the trees that he loved and the forests that he sought throughout his life to conserve and recreate.

Cutting the Lumber

From the forests of the States of Washington and Oregon were cut 10,643,739,000 feet of lumber during 1923, according to figures compiled jointly by the United States Forest Service and the Bureau of Census. This was nearly one-third of the total lumber cut of the country, which amounted to 37,165,540,000 feet. Washington, Oregon, Louisiana and Mississippi were the four leading states in the order named. Southern yellow pine timber constituted nearly 35 per cent of the cut and Douglas fir another 22 per cent.

Patrolling for Nature

Under the sponsorship of the Massachusetts Fish and Game Protective Association "the guardian plan for more hunting and fishing" has enlisted more than 10,000 people as volunteer patrolmen pledged to observe and assure the observance of the laws protecting forest, wild animal and fish. Pointing to this as an activity that other states might do well to follow, the *Outlook* says: "If a few lovers of nature, well distributed over the country, will put in less time deploring and more doing something to stop the destruction, we shall lay the ghost of a gameless, fishless, treeless country."

A Bird for Kansas

Meadow Lark, Cardinal, Chickadee, Prairie Chicken and Quail are the favorites in a nomination contest for the State Bird of Kansas being conducted by the Kansas State Teachers College through its weekly newspaper, *Public Service*. Returns in the voting on which of these or other birds will be called official the bird of Kansas had not been received at the time of going to press.

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Breaking In

Breaking into "The Conning Tower," the famed column conducted by F. P. A. in the *New York World,* is considered a feat of no mean importance. NATURE MAGAZINE broke in with a vengeance not long ago, even climbing to the distinction of leading the column. Here is how:

THE HELPING HAND

"Send your order now. NATURE MAGAZINE, 'The Publication That Is Making Nature So Popular.'"—Circular letter of American Nature Association, 1214 16th Street N.W., Washington, D. C.

When lovely Shelley stooped to folly,
And hymned the skylark he had seen,
All his poetic melancholy
Arose from NATURE MAGAZINE.

When Wordsworth, lonely as a rain-storm,
Saw daffodils upon the green,
The source of his ensuing brain-storm
Was found in NATURE MAGAZINE.

There's Burns! He penned a moving lyric
To celebrate the winter e'en.
What need to say this panegyric
Was due to NATURE MAGAZINE?

Eternal Nature (here a platitude),
Thou Teacher, Mother, Glorious Queen!
Kindly express thy deepest gratitude
To helpful NATURE MAGAZINE.
[*She does so.*] A. B. BERND.

Cornerstone Is Laid

There is more significance than may appear on the surface in the laying of the corner-stone recently for the Yosemite Museum, the new home of the Yosemite Nature Guide Service in the National Park of that name. It marks a dramatization of a work being carried on in our national parks, the full possibilities and values of which are only just being plumbed and realized.

An Animal Gypsy

One of the most wanderlusty of the fur-bearing animals is the American mink, ranging far and wide in search of food. In spring and fall they seem to feel the urge of the open road and set off on their travels, sleeping by day in hollow stumps or holes along the river bank and foraging and voyaging by night. The mink frequents the woods like the marten and loves the water like the otter. As a matter of fact it is much more adept in the latter element, diving and swimming with speed and skill, while on land it appears clumsy, using its short legs to travel by bounds.

Mosquito vs. Mosquito

Curfew has rung for the mosquito if the work of Dr. Legendre, of Paris, will stand extension. This scientist observed in Brittany a good mosquito that never stung and never entered

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For 20 years rose lovers the country over and beyond have annually and eagerly looked forward to the publication of the above.

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houses. He also discovered that wherever this mosquito was found the bad and biting variety was conspicuously absent. Dr. Legendre had an idea and introduced this harmless mosquito into the region Charente. The stinging kind disappeared, confirming the suspicion that it was warred on by the good mosquito. New Jersey papers will please copy.

An Oriental Ancestry

Some forty years ago a batch of eggs came from the Imperial Gardens of Peking, China, to Connecticut. Out of these hatched a few ducks and a solitary drake, white like those that waddled in the far eastern capital. There they had been seen by a traveling Connecticut Yankee and had inspired him to duck raising. The eggs made the long voyage with considerable loss, but the little brood that hatched established the American line of this imperial family of the duck world, a line that boasted more than three million progeny last year. Their raising on Long Island constitutes an interesting industry.

Harvard Botanic Garden

To make the Harvard Botanic Garden as noteworthy for its collection of herbaceous plants as the Arnold Arboretum is for its living museum of trees and shrubs, is the aim of the visiting committee headed by Roger Wolcott. The garden has been serving chiefly as a laboratory for botanical classes, but gradually its collection has been augmented. In order to further this the committee is urging increasing the endowment through public contribution. Stephen F. Hamblin, director of the garden and contributor of a series of shrub articles to NATURE MAGAZINE, is the recipient of donations from those who care to help.

Alabamans Fight Fires

Citizenship cooperation in fighting fires during the fall dry season was notable in 1924, reports Page S. Bunker, State Forester of Alabama. More than 1,000 citizens joined the state rangers in patrolling some two million acres. Mr. Bunker says that the sentiment of citizens to cooperate in keeping down fires is the measure of the extent to which the state can organize ranger districts and provide supervision, aiding in keeping down this tremendous loss that means such considerable economic disadvantage to communities and the state.

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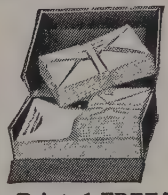

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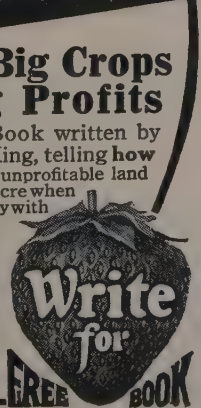

A Value in Reindeers

Domestic reindeer herds in Alaska are now worth $1,550,000 more than the United States paid to Russia in 1867 for the entire territory, according to the announcement of the Bureau of Education of the Department of the Interior. The reindeer industry is the infant industry of this northern land and has been developed since 1892 as a part of the work of educating the natives of Alaska. About 235,000 of the 350,000 reindeer are owned by natives.

New District Forester

Direction of the North Pacific District of the United States Forest Service became the responsibility of C. M. Granger with the opening of the new year and as a result of the resignation of George H. Cecil to enter private work. Mr. Granger has served fifteen years in the Forest Service and during the war was a captain of Forestry Engineers in France. Mr. Cecil has been with the Forest Service for twenty-one years.

"Skiing"

"Run down the list of sports and recreations in your mind and note how many of them require a troup of equally skilled partners in order to make them successful," says Ornulf Poulsen in his book "Skiing." "Take baseball, tennis, hockey—in all of these the choice of your associates is one prime essential. And even in sports that are fundamentally individual, like golf, the interest lies in competition with another who is about equally well matched. The hunter is a solitary, but he must have something to hunt. The mood of anglers approaches most nearly to the skiers-by-birth, those men who love skiing for its own sake and are equally happy in a jumping competition with thousands present, or off on some distant skyline following the horizon for the day, alone."

A Real Spirit

Written with a surpassing informal charm and attractively illustrated, "The Spirit of the Wild" by H. W. Shepheard-Walwyn and published by John Lane, the Bodley Head, Ltd., of London, is a delightful contribution to contemporary nature writing. The several fellowships that the author has in various societies of scientific names are rather appalling at first until one reads the first sentence of his foreword: "I like to believe in spirits." The second sentence intimates a like tendency towards belief in fairies, thus luring the many of us who secretly admit to ourselves that we do, too, into a fascinating volume. Mr. Shepheard-Walwyn is a shrewd observer, a capable reporter, an alluring writer and, withal, an accomplished naturalist. We shall read his book again some day when the world of man has seemed particularly slavish in its devotion to our machine-ridden civilization.

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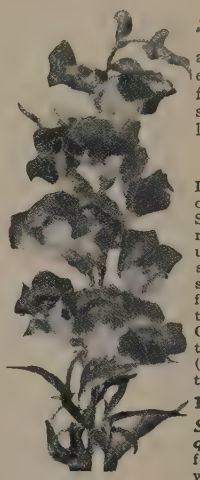

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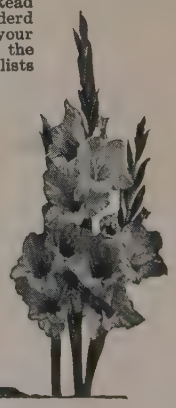

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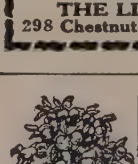

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Flowers in Verse

Introduction to knowledge by means of light verse is no new method, but it is one that requires a deft and accurate touch. Sarah Phelps Stokes Halkett (Aunt Sadie) has supplied such a touch in a fascinating volume entitled "Elf King's Flowers," published by E. P. Dutton and Company, New York. Besides the attractive verses that are each a brief and enjoyable lesson in nature knowledge, the book is illustrated with a frontispiece by Katherine Pyle and drawings of each flower by the author. It is a proper volume for the youngsters' library, and spring and summer will find the boy or girl seeking to link verse with growing flower.

An African Holiday

"I had often wondered how it would feel to be charged by dangerous game, and at first I was just a trifle squeamish as to how I should act," so says Richard L. Sutton, M.D., in his book entitled "An African Holiday," published by the C. V. Mosby Company of St. Louis, Missouri. "Unarmed, I suspect that anyone would be pretty badly scared, but when properly equipped with a weapon which one knows how to use and in which one has confidence, the feeling is one of exhilaration rather than fright. Overconfidence gets many people into trouble, but ordinarily in dealing with rhino, lion and buffalo, especially in open ground, it is as if one had been switched back to primitive time, and man was once more matching his strength and wits against his age-old enemies in the animal world. Needless to say, he should be able to hold his own."

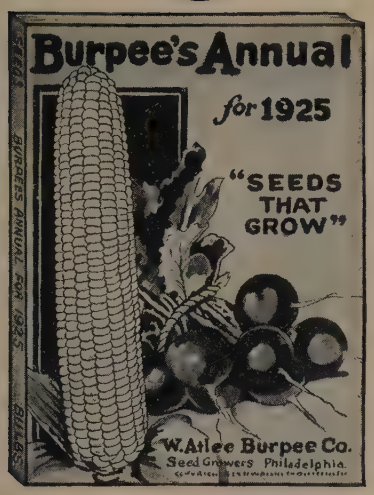
What Produces Fog

"The warm, damp air above the Gulf Stream when it is blown over the colder waters of the ocean produces fog," so says Sidney Aylmer Small in his book entitled "The Boys' Book of the Earth," published by E. P. Dutton & Company, 681 Fifth Avenue, New York City, N. Y. "The water in the air as invisible vapor is condensed to fog in cooler places. Near the Gulf Stream it is often so foggy that ships cannot tell exactly where they are. In such foggy weather on an Atlantic liner one usually sees a sailor lowering a bucket over the side of the ship, first on one side and then on the other, and hoisting up a bucket of water. He sticks a thermometer into each bucket and carefully reads the temperature. Every little while he reports to the bridge, so the striking of the Gulf Stream can be detected. For this gives valuable information as to the position of the vessel."

Insect Cannibals

"Cannibals are just as scattered in the insect world as they are among us," so says Royal Dixon and Brayton Eddy in their book entitled "Personality of Insects," published by Charles W. Clark Company, 235

Burpee's Seeds Grow



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West 23rd St., New York City, N. Y. "A few Beetles, an occasional Spider, a Cricket here and there, a Scorpion, and the Mantidae are about the only offenders. Like the natives of the Fiji Islands, they usually devour their kind simply because they are of no further use, although jealousy is sometimes the reason.

"None are quite as savage as the Praying Mantes. Here even the females will battle among themselves, scratching and gripping at one another, pulling and hauling until the stronger, triumphant, is left to eat of her conquered foe. In the mating season the contest is less keen, for the wooer is an easy prey to her ravenous appetite. She will accept his addresses, and then, even while in his embrace and quite without a move in defense, she will snap off his head, devouring his remains at her leisure.

"No less submissive is the Scorpion of Southern France. Even though he is provided with a deadly spike at the end of his tail, he will not use it to protect himself again his murderous wife. And the Garden Beetle is just as yielding. Apparently they realize that their use in this world is now over, that to become one in body and soul with the woman they love is to be assured of a glorious hereafter. Perhaps they think it more noble to be eaten by a friend than by an enemy, as the Mole Crickets often are."

The Monkeyfolk

"We don't grow crops or keep animals to be killed and eaten or to lay eggs, or to give milk," so says F. W. Fitzsimons in his book entitled "The Monkeyfolk of South Africa," published by Longmans, Green & Company of 55 Fifth Ave., New York City, N. Y. "We just eat anything which is good to eat that God has provided. We are today doing just what your ancestors did hundreds of thousands of years ago. If you study that science which is called anthropology, you will find that your race once lived in caves, and their ways and habits were just like ours. Your ancestors, in those far-distant days, lived on what they could find in mountain, veld, forest and streams. There is no need for any of us baboonfolk to starve. There is plenty of food for all. We are practically vegetarians. When we get tired of that food, we hunt for beetles, caterpillars, centipedes, scorpions, and other creepy things. The scorpions are our daintiest morsels. You know the fellows I mean. They are the kind which hide under stones. They are as long as your thumb, with nippers like a crap, and a tail with a dreadful sting at the end of it. We find plenty of those scorpions by turning over the stones on the hillsides. As soon as the scorpion is alarmed, he raises his tail, ready to prod his sting into his enemy. So we just grab the tail between our finger and thumb and nip off the end of it, with the sting. Then we pop the scorpion into our mouth and chew him up. They have a delicious flavor."

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Bird Migration

"Many strange ideas have been entertained about bird migration. At one time it was thought that some birds migrated to the moon. Some thought that one kind of bird changed into another kind. The European cuckoo was said to change into a hawk. Swallows and swifts were thought to go into the mud with the frog to pass the winter. In recent years more attention has been paid to this subject. Records have been kept, and the bird students of different continents have compared their discoveries. At the present time the movements of practically all of our birds are known. Some of the flights that our birds make are almost beyond belief. For example, the golden plover, which nests on the shores of the Arctic Ocean, winters in Argentina, 8,000 miles away. The Arctic tern may travel 11,000 miles between its winter and summer homes. The black poll warbler flies 7,000 miles to the place where it rears its young. The Baltimore oriole winters in Central America, while the bobolink winters in Brazil. The red-eyed vireo and kingbird spend the winter in Bolivia, and the yellow warbler in Peru. At least one of our North American birds, the wheatear, which nests in the Arctic regions, passes the winter in West Africa, migrating through the British Isles," says Smallwood, Reveley and Bailey in their book, "New Biology," published by Allyn and Bacon, New York.

Is There an Increase?

With the help of unpaid volunteer observers, the Biological Survey of the United States Department of Agriculture is taking a bird census in selected areas throughout the United States to furnish information on the effectiveness and thoroughness of bird protection and to throw light on many problems concerning the distribution of bird life.

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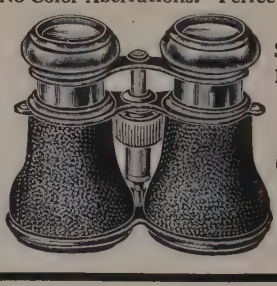

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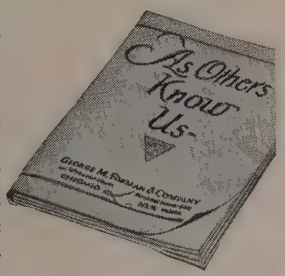

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Story of a Red Fox

"He may have been a month old when I decided to offer The Sprite a change of food. One evening, after he had been fed on milk as usual, and when he lay curled up asleep on the fur rug before mentioned, I awoke him and held out a piece of raw beef," says Ernest Harold Baynes in his book, "The Sprite, the Story of a Red Fox," published by Macmillan, New York. "He was sleepy, and at first took little notice of my offering. In a moment, however, he sniffed it with great interest, and then, with a fierce little cry, he seized the meat in his teeth. The change which came over him was startling to me. The gentle, little, woolly, milk-fed cub, which a moment before would have closed its blue eyes and gone to sleep in the hollow of my hand, had in an instant become a savage wild beast, quivering with excitement, snarling fiercely, and with curled lips, and ears laid back, snapping with its baby teeth at the hands which sought to caress it. It was with a feeling strangely akin to sadness that I took the meat away, placed it on a shelf in a corner, and carried the struggling little wild thing into another room."

Cloudland

(CONTINUED FROM PAGE 99)

characteristic funnel-cloud of tornadoes and waterspouts, for which the name *conus* was once suggested by a bygone cloud-classifier.

Of course the scientific exploration of cloudland includes many important projects besides the naming of the clouds. Measurements of the heights and movements of clouds are made throughout the world, and were carried out on an especially elaborate scale during the International Cloud Year (1896–7). The instrumental methods vary from the use of simple *nephoscopes* to refined triangulations with the aid of theodolites and sometimes special photographic equipment. Observations of clouds, reported by telegraph, are a part of the routine data supplied to weather forecasters. Interesting problems in regard to the composition and structure of the clouds still await solution. Down to about 1870 most meteorologists cherished the curious idea that the droplets in the clouds were hollow, like soap bubbles, but we now know that they are ordinary water drops, though so tiny that it would take about 8,000,000 of them to make a good-sized raindrop. We do not know, however, how ice clouds and water clouds can occur in air of the same temperature and change from one form to the other at temperatures far below freezing, nor is it at all clear how cloud droplets change to raindrops. These are some of the questions upon which the close-up observations of aeronauts may eventually throw much light.

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Try this at the attic and basement as well. There will be a draft at each. It goes on all night from bedrooms, constantly from the basement, while warm air escapes to the unused attic. That is why bath and breakfast rooms are almost always cold in the morning.

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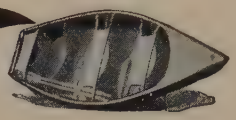

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Red Twigs and Yellow

(CONTINUED FROM PAGE 88)

midwinter is no time to look for flowers, but the bright red rose hips are another attraction. Three others are found with the Shining Rose, and, except for height, are very similar. Bristly Rose (*R. nitida,* Canada to Massachusetts) is less tall and densely orange bristly as well as prickly. Pasture Rose (*R. carolina,* once *R. humilis*) has the pair of straight prickles and scattered bristles also. It is scarcely a foot high, ranging from Maine to Oklahoma. Swamp Rose (*R. palustris,* once *R. carolina*) has the prickles hooked, and is a taller plant (five to six feet). It is found through Canada and our northern states in swamps or the edges of ponds.

Meadow Rose (*R. blanda*), found in Canada and our lake region, is the prize of our eastern wild roses. Contrary to proverb, it has no prickles and scarcely a bristle, save at the base of strongest shoots. You can pass your hands through the bush freely without fear of scratches. It is a northern species and, unlike most roses, prefers a limestone soil. It grows perfectly well close to the house, for it likes good drainage and the lime from the house wall. The wild-rose blossoms in June are far more abundant than on any other American wild rose, and its hip crop is plentiful all winter. Some day this rose will be of great service in breeding new garden roses.

Most curious of all is White Shining Rose (*R. virginiana alba,* or *R. lucida alba*), which botanists say is *R. lyonii alba.* The leaves are a pale green, the flowers pure white—possibly the only wild white-flowered rose east of the Rockies—but the greatest attraction is the pale yellow-green of the stems in winter, in great contrast to our red twigged kinds. So great is the demand for it that nurseries rarely have it in stock, and it is not very plentiful in the wild.

The Collie

(CONTINUED FROM PAGE 81)

cowardly collies has been almost negligibly small, compared to the throng of bad-tempered or stupid or cowardly humans I have known. But mere bad temper is not treachery.

Let me make one exception to this claim of mine that collies have not a drop of treachery in their blood. Or, rather, let me tell you of a dog we owned, and let you judge for yourself whether or not he was treacherous. In a sense, he was. As follows:

He was a big tricolor collie, Boze by name, brave and friendly and clever, and the everwatchful guardian of the Sunnybank children. There was a peddler who used to come here, in the old days—a man with a wooden leg. Boze would frisk out to greet

him hospitably. Then he would step behind the man and bite him. Always he bit him in the wooden leg. Never elsewhere. Always he followed the bite by a grin of the most delighted mischief. Now this may have been innate treachery or it may have been merely Boze's way of letting the peddler and all the world know that he was not fooled by the sham of the wooden leg. He bit no one else. When I say I have never known a collie I considered treacherous, it is only honest for me to cite this one possible exception and let you draw your own conclusions from it.

As to show dogs having no sense: Young Champion Alstead Aeroplane was a handsome collie, but listless and dull. Never had he caught so much as a mouse. Never had he roamed the woods. Never had he eaten, save from the balanced rations in his zinc dish. To me he seemed one of the very few brainless collies I had seen. He was sold by his breeder to a man named Donaldson, who lived near Toronto. The day he arrived at his new home, Aeroplane escaped. To the forests he fled, he who had never taken an unchaperoned walk of a half mile.

There in the bitter winter cold of the Canadian woodlands he made his lair. There he lived for about a year. He lived by catching rabbits and birds and by raiding farm hencoops. When a dog catches a chicken he does so with a racket that can be heard for a quarter mile. Aeroplane learned at once by instinct how to track and slay a chicken noiselessly, as does the fox or coyote. Uneducated, densely ignorant, he made a fat living off the bleak countryside and wilderness for nearly a year before he was caught (after a murderous resistance) and returned to captivity. How did he do it? Surely such a struggle for existence called for brain as well as for instinct. Yet he was one of the most intensely developed show collies of the century.

For all that, when you are choosing a collie, select him for his brain and his disposition—never for his mere show points. There are only a few shows in the course of the year. But your collie is your chum for 365 days of every year. Better the least good-looking collie that is an ideal chum than the costliest show-specimen that is lacking in all the traits a collie should have.

Troubles and So Forth

(CONTINUED FROM PAGE 86)

"How about this hibernating?" we inquired.

"When the first ice appears it is a signal to disappear," Mr. Hahn replied. "Soft mud under the banks of a pond or stream or under roots and grasses in shallow water on the sunny side of a marsh are the places sought. Just below the frost line they bury themselves, often moving during the winter, and sometimes to be seen lying directly against the ice on its under side."

We had visions of the snapper dying of smothering and showed our ignorance by saying so. This was the explanation:

"The snapper is able to take water into the body and extract oxygen from it. Snappers caught in nets where it is impossible to reach the mud or get to the surface

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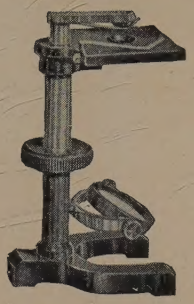

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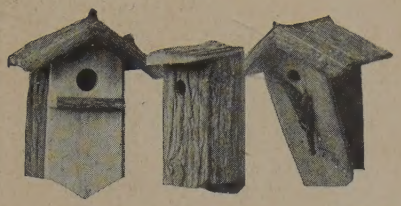

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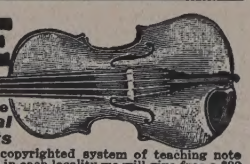

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will often drown, but they can be resuscitated if you use the same method as on a waterlogged human. Let the head remain lower than the body and work the front legs as you do the arms of a person."

We smiled at the picture of red-crossing a snapping turtle.

Not only has Mr. Hahn set about raising turtles, but he has been carrying on research for facts about the snapper that he was unable to find recorded. Through marking and observing he has concluded that the young snapper does not grow to weigh more than an ounce on its first three years. In fact, its first ten years of life are marked by slow growing, and Mr. Hahn asserts that the turtle never gains more than a pound a year. One hundred years he gives them as a span of life. He has tabulated many statistics of length and weight, a trouble which few—if anyone—have gone to.

While we were talking, the eyes of the inquirer wandered to a smaller basin. In it were a small brood of different-looking turtles. Instead of the rough, ridged and dull oblong backs of the snappers, these fellows had smooth, flatter and more prettily marked and rounded dark green upper levels. Instead of the soft undersides of the baby snappers, the lower shell of these babies was a delicate coral pink of the autumn sunset. The edge of the underside of their top shell was rayed pink and black-green. Their little claw-tipped legs, that stuck out between their two levels of hard shell like a man's arms and legs out of a suit of armor, were striped orange or yellow and black. The gleam in their eyes was more avid; their tails shorter and more aristocratic; and their telescopic necks collared in stripes of yellow and black. Appealing little chaps, who pushed manfully against your fingers and craned their necks protestingly when you held them keel-side up.

"Those are painted terrapins," Mr. Hahn said. "It's a close rival of the diamond-back and doesn't weigh much more than a pound and one-half when full grown. It grows slowly, also, lays its eggs like the snapper, only these eggs are oblong shape. You see, a round terrapin out of an oblong shell. They hibernate much like the snapper and have their other similar habits."

"This other one," said Mr. Hahn, pointing to a smaller turtle, "is a musk terrapin, more often known by the elegant name of stinkpot. It gets its name from its musky odor. It is sort of a connecting link between the painted terrapin and the snapper, sharing the habits of both, and being particularly distinguished by its delight in stealing fishermen's bait."

We discussed turtles intimately and extensively until train time. Then Mr. Hahn inquired whether we would like traveling companions. We would, we said, and to the delight of several Pullman passengers and the disconcertment of the porter we had turtle and terrapin races between Mike and Ike, Terry and Tillie all the way back to editorial duties.

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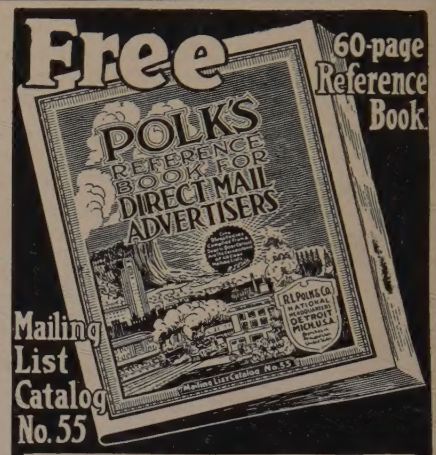

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—Charles Lathrop Pack, President, American Tree Association.

Through H. C. Morse, of the Fulton County Farm Bureau Association, 44 Boy Scouts have joined the tree-planting army by planting trees at Gloversville, N. Y.

Pupils of the L. G. Hine, Jr., High School of Washington have joined the American Tree Association by planting a tree on the school grounds.

Members of the West End Improvement Association of Elizabeth, N. J., through the secretary, R. R. Engisch, have joined the tree-planting army and more planting is to be done in the spring.

The Prairie Club of Chicago, with 1,200 members, is making plans to join the tree-planting army. Jennie M. Petterson, the secretary, notifies the American Tree Association of the club's work for the McNary-Clarke Forestry bill.

Jos. B. McConnell, Boy Scout Executive of Saratoga Springs, N. Y., directs the tree planting of 48 boys who are now members of the tree-planting army.

The Akron Eagle Scout Council is studying reforestation under the direction of John M. Pittenger. I. S. Meyers, of the Ohio Fish and Game Association, is helping the boys in this work.

At Brookside Farm, Roosevelt, N. Y., several tree planters have been listed in the tree-planting army by Lott H. Van de Water, Jr. Among those planted were memorial trees for Theodore Roosevelt and Calvin Coolidge, Jr.

Julia M. Rocheford, of the University of Missouri, has become a member of the tree-planting army.

Members of the Conservation Department of the Detroit Federation of Women's Clubs are joining the tree-planting army under the direction of Mrs. Ford Smith.

At Ypsilanti, Mich., the Federation of Women's Clubs has a big tree-planting campaign under way this spring. Mrs. A. F. Burke is directing the plans for the planting.

The West Pullman's Woman's Club has joined the tree-planting army and the registrations made by Mrs. W. L. Ford.

Members of the Science Department of the Lillington, N. C., High School have joined the American Tree Association. The registrations were made by T. I. Holleman.

A tree-planting program was conducted at the Glandale, Calif., Sanitarium and Hospital, tree-planting information having been sent on to Daisy N. Harris, superintendent of nurses. The tree-planting was incident to moving into a new building.

Nathaniel L. Britton and Elizabeth G. Britton, of the New York Botanical Garden, are now members of the American Tree Association.

The Outdoor Nature Club of Houston, Texas, through J. M. Heiser, Jr., informs the American Tree Association of its campaign for saving the Holly.

At the meeting of the American Nature Study Society in Washington a resolution was adopted approving of the movement for a national arboretum for Washington.

Old Glory Chapter, D. A. R., of Franklin, Tenn., will join the American Tree Association this Spring. Mrs. W. W. Campbell, the regent, has registered in the tree-planting army.

Progress toward a national forest policy is making rapid strides reports to the American Tree Association show. The first meeting of the new year was that of the Southern Forestry Congress at Little Rock, January 19. A forestry commission has just been appointed in that state.

Governor Groesbeck, of Michigan, has asked state officials for data upon which to base a two-year program looking to reforesting that state.

The first town forest of the new year will be begun at Brattleboro, Vt., when ten thousand red pines will be planted for a starter. Vermont is planting about 900,000 trees a year.

Efforts will be made by the Pennsylvania Forestry Association this year to secure passage of a bill authorizing a state loan of $25,000,000 for the purchase of wild lands for the state. Dr. Henry S. Drinker is actively behind this movement.

The people of Wisconsin have voted an amendment to the state constitution to permit the state to reforest waste land.

The only way to join the American Tree Association is to plant a tree and register it with the Association, 1214 Sixteenth Street N.W., Washington, D. C. The Association will send tree-planting suggestions and a tree-day program for two cents to pay postage. Make your spring tree-planting plans now.

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